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COMPATIBLE AUTOMATED LIBRARY CIRCULATION CONTROL SYSTEMS

by
Charles R. Umstead
Computation Center

and

Fred E. Croxton
Redstone Scientific Information Center

April 1967

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Army Technical Library
Improvement Studies (ATLIS)
Report No. 14

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Redstone Scientific Information Center
Research and Development Directorate
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ABSTRACT

This report describes five more or less standard and highly compatible circulation systems which incorporate a common form of input and which require a minimum of conversion from traditional manual operations. These five systems are: (1) manual system, (2) punch card accounting machine circulation system, (3) small scale control system, (4) large scale control system, and (5) on-line control system.

ACKNOWLEDGMENT

Many individuals contributed to the Automated Literature Processing Handling and Analysis (ALPHA) system, including members of the Redstone Scientific Information Center, Research and Development Directorate, U. S. Army Missile Command; the Computation Center, Army Support Operations Directorate, U. S. Army Missile Command; and the Huntsville Operations of the General Electric Company Computer Department. Extensive documentation of the ALPHA system is now being prepared and when completed will be issued as Report No. RSIC-549.

The present report contains a great deal of detail on edits, errors, and other programming and operating subjects which have been taken more or less directly from documentation written originally to guide programming of the ALPHA-1 and ALPHA-2 systems and as preliminary specifications for NAPALM (STINFO Level 2). As a result, special personal acknowledgment is due W. J. Wilson, General Electric Company, with respect to much of the language on off-line computer systems and to L. J. Cooney, Redstone Scientific Information Center, who led the design work for the on-line system.

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Section I. INTRODUCTION

Conversion and compatibility constitute two major concerns in the institution of automated systems in libraries. This is particularly true for families of libraries.

One of the most obvious library functions amenable to automation is circulation.

As a consequence of these two facts, we have undertaken to outline a family of more or less standard and highly compatible circulation systems which incorporate a common form of input and which require a minimum of conversion from traditional manual operations. The systems allow for multiple types of material. There are five members of the "family:" (1) manual system, (2) punch card accounting machine (PCAM) circulation system, (3) small scale control system, (4) large scale off-line control system, and (5) on-line control system.

Several primary requirements are levied on the design or on the library, if the compatibility and ease of conversion we seek is to be practical. These requirements for the design are as follows:

1) Input format to all systems in the family will be identical.
2) Outputs will support all the normal controls available through traditional two-card library systems.

For the library, the requirements include the following:

1) All patrons will be registered and uniquely identified.
2) Each physical item will have a unique identification number (e.g., call number plus copy number).

Perhaps the most significant element in this family of systems is their compatibility. Experience in our organization (we have progressed through two sophistication levels of automated circulation control and are now proceeding to a third) has clearly demonstrated that the practical problems of accurate data capture and of data conversion exceed all others in automating a circulation system. This factor, coupled with the high cost of verification (and the obvious consideration that since the systems call for a removable book card, decks of cards or record tapes for mechanical conversion are eliminated), calls for a common book identification format. Thus, first consideration was given to an input (or loan) record which could be effectively used throughout the family. This common format is shown in Figure 1.

1. Call Numbers

The constraints in identification or call number assignment imposed by these systems are very few.

Each item to be circulated must be identified by a unique identification of not more than 36 characters. Throughout these systems the style of call number used in the Redstone Scientific Information Center (RSIC) has been specified. Its form includes formal Library of Congress (LC) class notations in which minor (and common) spacing changes have been made. Where identifications of other types are in use (other classification notations or pure identification numbers), these too can be incorporated if unique and not over 36 characters in length.

Item identification numbers for individual items must remain constant throughout the life of the item in the system and no provision has been made for case changes (e.g., for books, work marks are to be upper case).

2. Patron File

As indicated above, one of the primary constraints is the registration and unique identification of borrowers. The social security number is used as the identifier, separating borrowers with like names and assembling the same person listed with name variations.

The use of social security numbers, now required of all U.S. taxpayers, gives flexibilities and compatibilities which will not be fully exploited for years.

There are numerous reasons for seeking compatible operating techniques for Army libraries, especially in cases in which the function involved is (or may be) automated. Among these reasons are the following:

1) Lower cost method development.
2) Easy network interconnection.
3) Simplified training.
4) Flexibility of personnel.
5) Transferability of data.

It is suggested, therefore, that those Army libraries established in the future consider initiating their circulation control using the format and method shown here. It is further suggested that Army

libraries which automate their circulation procedures consider first one of this family of systems with its specific input formats and conventions. Initial NAPALM base line programs in the Level 6, STINFO Functions, will incorporate these formats as proposed standards.

The reader will notice that there is no guidance for proceeding up or down the scale of system sophistication as the needs of the library change. It was felt that the general approach to this problem was indicated by the nature of the systems (their similarities and differences). Specific approaches will be affected by local situations. Often the determination of level of sophistication of the computer system will be controlled by available time on available computer equipment. One general admonition, however, is in order: operate parallel systems or work with several batches of live data during a test or checkout period.

Section II. MANUAL LIBRARY CIRCULATION CONTROL SYSTEM

1. Introduction

The following represents a book circulation system using a 026 Keypunch as the basic document preparation device.

The system is so designed to lend itself to automatic machine duplication of the patron and book data from transaction to transaction after the initial data capture has been achieved. The only punching required to record a book on loan is loan date and type of loan, which must not exceed a maximum of five columns. This technique eliminates the need for verification of each transaction, since the transactions are duplicated from previous verified data.

The forms and controlling punched card files can be used to operate fully a manual system and as input to more complex PCAM systems as well as computer applications, including on-line systems. There is no need for additional data or alteration of existing data for any system that might be employed to control book circulation since it will be provided in the initial data capture.

The manual system provides two options. Option one requires an additional file to be set up by recall date. Option two can be employed by an identification punch on the top of the charge card or by marking the top of the charge card with various colors to denote when recall action is required. For example, if the identifying punch system is used, the charge card would be notched at the top of each fifth column. Column 5 would represent January recalls, column 10 February etc., through column 60 for December recalls. However, the recall file provides for positive action without the need for file searching as would be required using the identifying punch or color schemes.

Input to the system is a single source patron request card (form 10) which is converted by keypunch into a patron data file and then is subsequently used to process all recurring patron transactions. The patron data are used in conjunction with a prepunched book card, to produce multicolored patron charge cards by a machine duplication process which controls the circulation of books.

The following files are required in the manual system:

1) The patron charge card (blue card, Figure 1) must be filed behind the patron data master.

2) The circulation file (red card, Figure 1) must fall in sequence by book or document title, patron name, and social security number.
3) The recall file (orange card, Figure 1) must fall in sequence by recall date, patron name, and social security number. This is not required when the identification punch system is used.
4) The patron data master file (white card, Figure 2) must fall in sequence by patron name and social security number.
5) The book card (white card, Figure 3) should remain with the book at all times.

Codes to be used are as follows:

1) Action codes:

   a) 1 Check out.
   b) 0 Lost.
   c) 2 Recall of loan.

2) Security classification:

   a) 0 Unclassified.
   b) 1 Confidential.
   c) 2 Secret.
   d) 3 Top Secret.

3) Type of loan:

   a) 1 Regular.
   b) 2 Interlibrary.
   c) 8 Branch library.
   d) 9 Extended.

2. Processing Procedures

The processing procedures can be better understood by studying the logic diagram shown in Figure 4. Preparation of patron request card (form 10), as shown in Figures 5 and 6, is as follows:

1) Patron completes all items on form 10 except the first two, which are identified by an asterisk.
2) Librarian completes items one and two and reviews form for accuracy.
3) The completed form 10 (Figure 3) is used to prepare the patron data master card (Card 1, Figure 2) and the patron address card (Card 2, Figure 7).

4) Form 10 is filed in permanent hold file by patron name and social security number.

5) Punched patron data master card(below) is filed in patron master file by patron name (columns 67 through 80) and social security number (columns 57 through 66).

Patron Data Master Card

Card Cols	Description	No. Cols	Punching Instructions
1	Action Code	1	Alpha Numeric
2	Card Code	1	Punch digit 1
3- 4	Citizenship	2	See Figure 8 for citizenship code
5-11	Phone No.	7	Numeric
12-15	Extension	4	Numeric
16-33	Organization	12	A/N Left Justified
34-38	Building No.	5	A/N Left Justified
39-42	Room No.	4	A/N Left Justified
43	Mail Code	1	Numeric
44	Type Patron	1	Alpha
45	Security Clearance	1	Alpha
46-49	Title	4	A/N Left Justified
50-52	Suffix	3	A/N Left Justified
53-56	Date	4	Numeric
57-66	Social Security No.	10	Numeric
67-78	Surname	12	Alpha Left Justified
79-80	Initials	2	Alpha

Note: Card 2 (patron address card) is not used in a manual system. The form 10 hold file is the source for obtaining the patron's address when required.

Preparation and maintenance of patron charge file are as follows:

1) Remove the previously prepared book card from the book. This card should contain action code (column 1), call number followed by an asterisk, author abbreviated title (columns 2 through 50), and security code (column 51).

2) Remove patron data master card from file and verify all entries on the card with the patron. If patron data has changed, prepare new patron master card. Retain old patron card for correction of files.
3) Insert patron card into read side of keypunch and book card into punch side. Keypunch type loan (column 52) and loan date (columns 53 through 56) then duplicate columns 57 through 80 (social security number, surname, and initials) from the patron card into the book card.
4) Duplicate the book card 80-80 on to a charge, circulation, and recall card. Verify data by sight checking 80-80. Hold charge card for step 8) and circulation and recall card for step 9).
5) The original card should be placed in the book and returned to the patron.
6) If the patron's social security number, surname or initials have changed since last loan, remove all charge cards from patron file. Duplicate all charge cards 1 through 56. Then place the patron card in the read side of the keypunch and all charge cards for that patron in the card stacker duplicate columns 57 through 80 of the changed patron card into columns 57 through 80 of all charge cards for that patron.
7) Duplicate all of the corrected charge cards on to a set of circulation cards and a set of recall cards.
8) File the corrected patron master and all charge cards into the patron file by patron name and social security number.
9) File the recall cards in the recall file in sequence by recall date and the circulation card into the circulation file by book or document call number.
10) Purge the circulation file and recall file using the old charge cards from step 6). Destroy all cards purged.

Processing returns (Figure 9) by patrons are as follows:

1) Remove the book card from the book and duplicate the card from column 1 through 52.
2) Refile the duplicated card into the book and replace in library.
3) Use the original book card to purge the patron data master file, circulation file, and recall file.
4) Destroy all purged cards.

Processing of delinquent recalls (Figure 10) are as follows:

1) Remove delinquent charge cards from the recall file.
2) The patron should be contacted by phone. However, if no phone is available, the delinquent notice should be sent by mail.

3) Annotate delinquent charge cards with the number of followup actions.
4) After three followup actions, the charge card will be punched with a lost code 0 in column 1.
5) Purge all files, destroying all cards except the recall card.
6) Place the recall card in books lost file for reorder action.

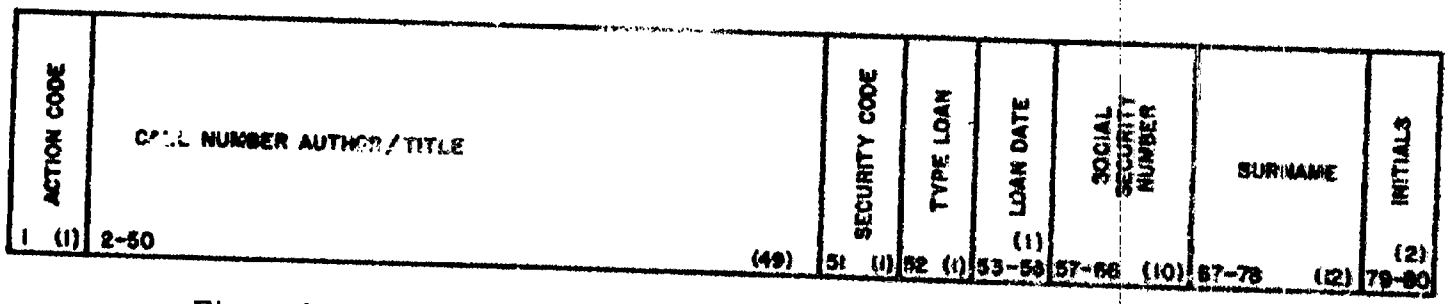


Figure 1. Patron Charge Card, Circulation File Card, Recall File Card

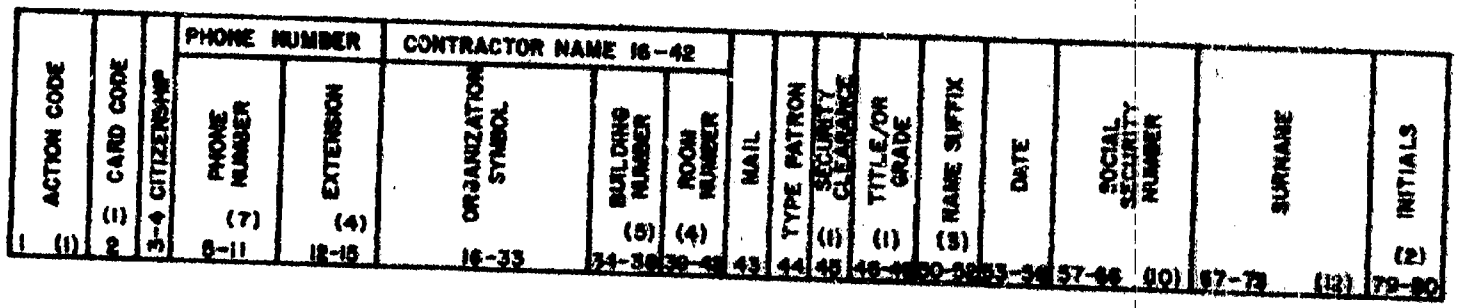


Figure 2. Patron Data Master Card No. 1

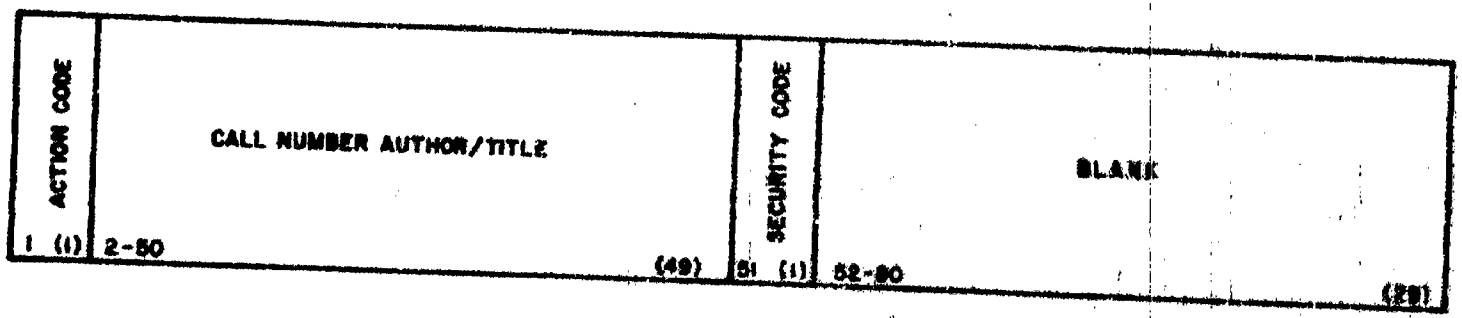


Figure 3. Book Card

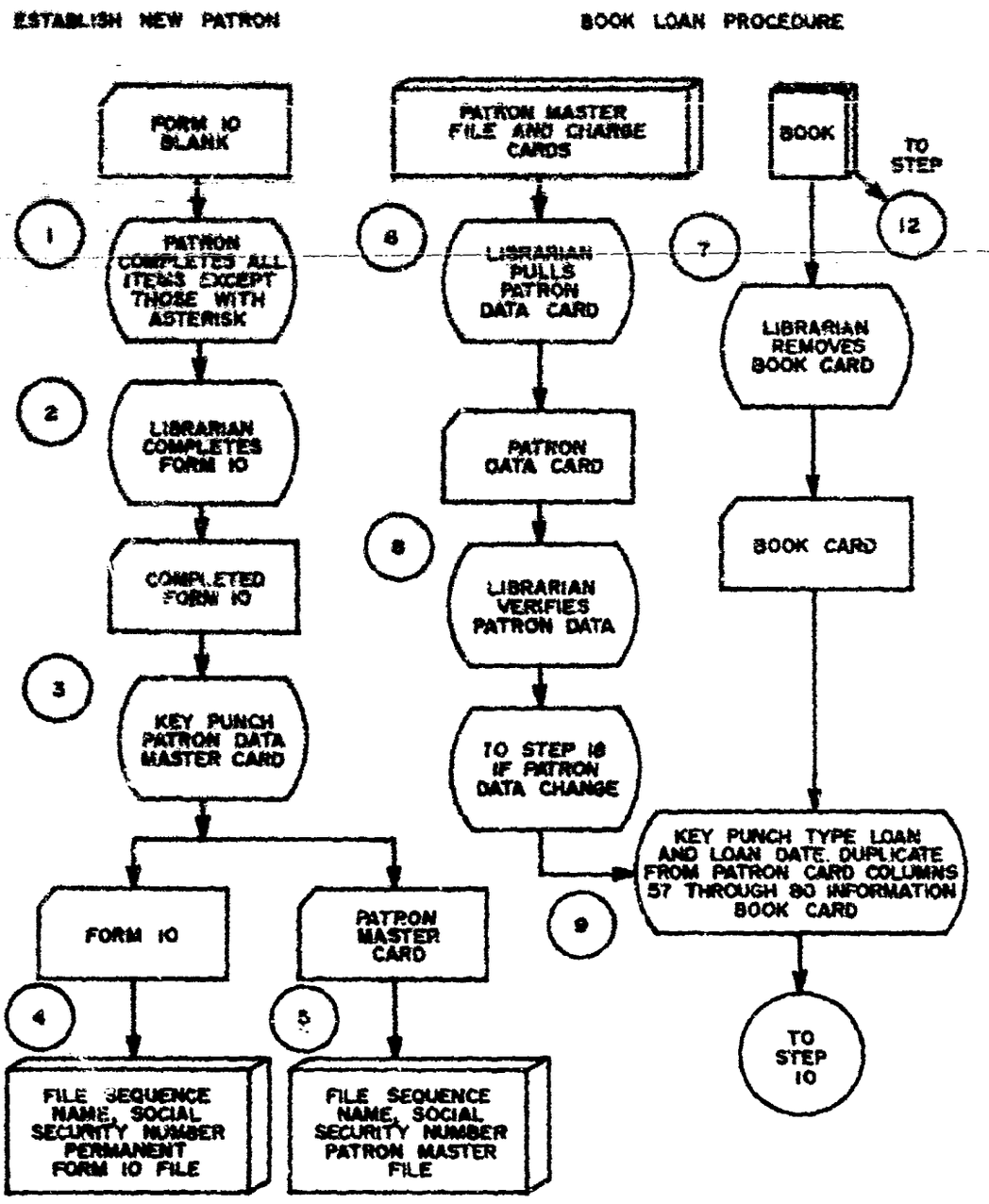


Figure 4. Circulation Control Logic

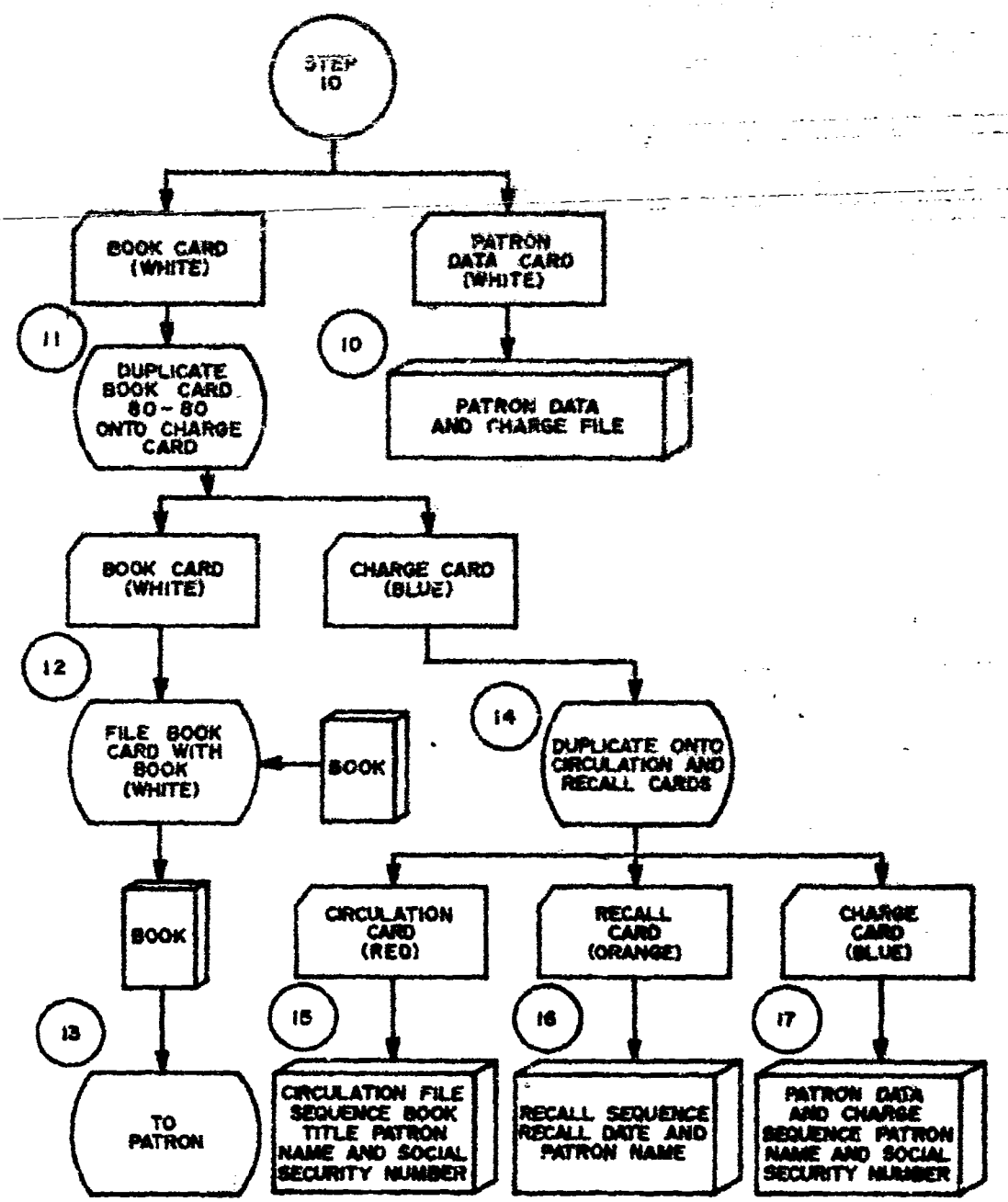


Figure 4. (Continued)

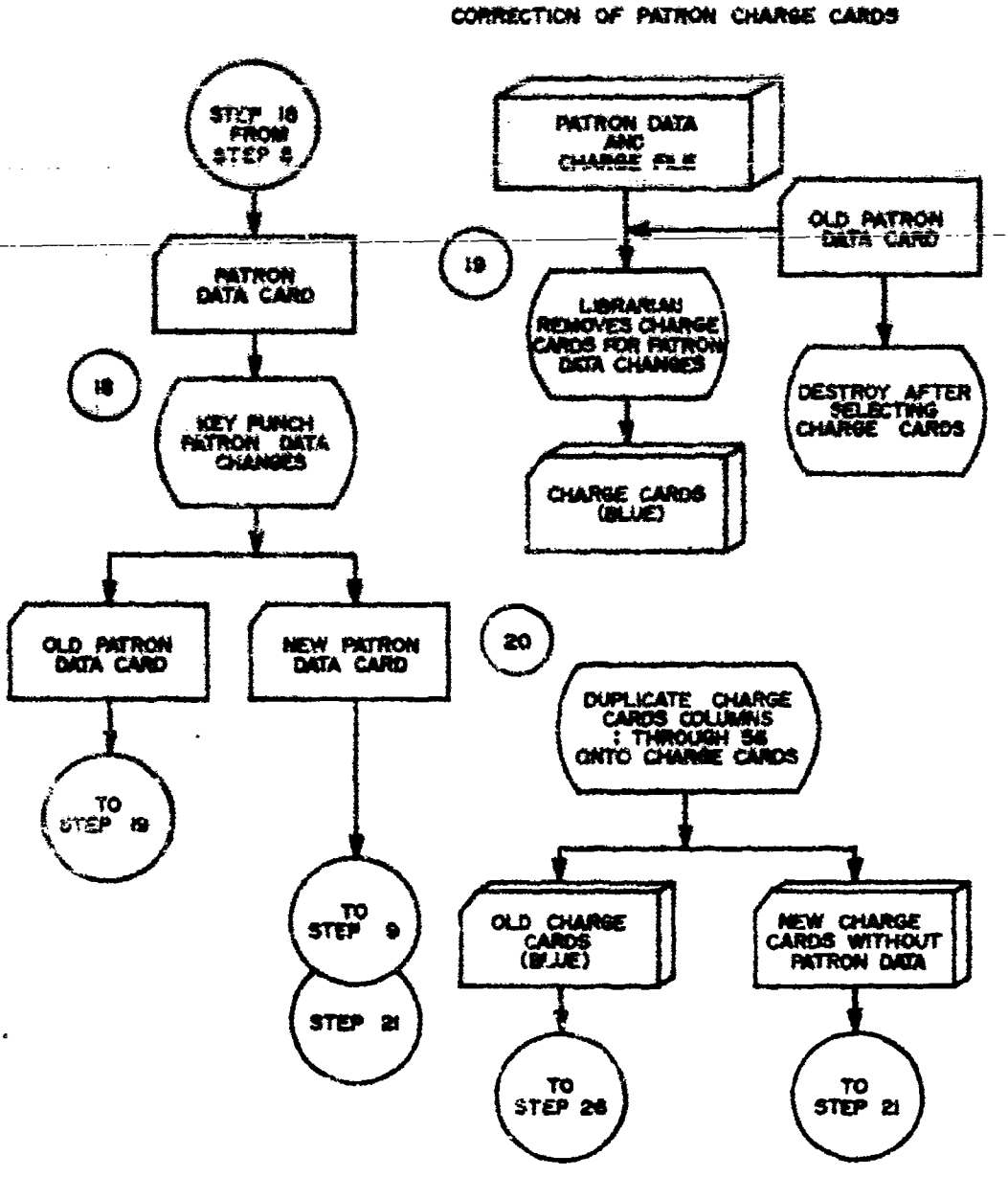


Figure 4. (Continued)

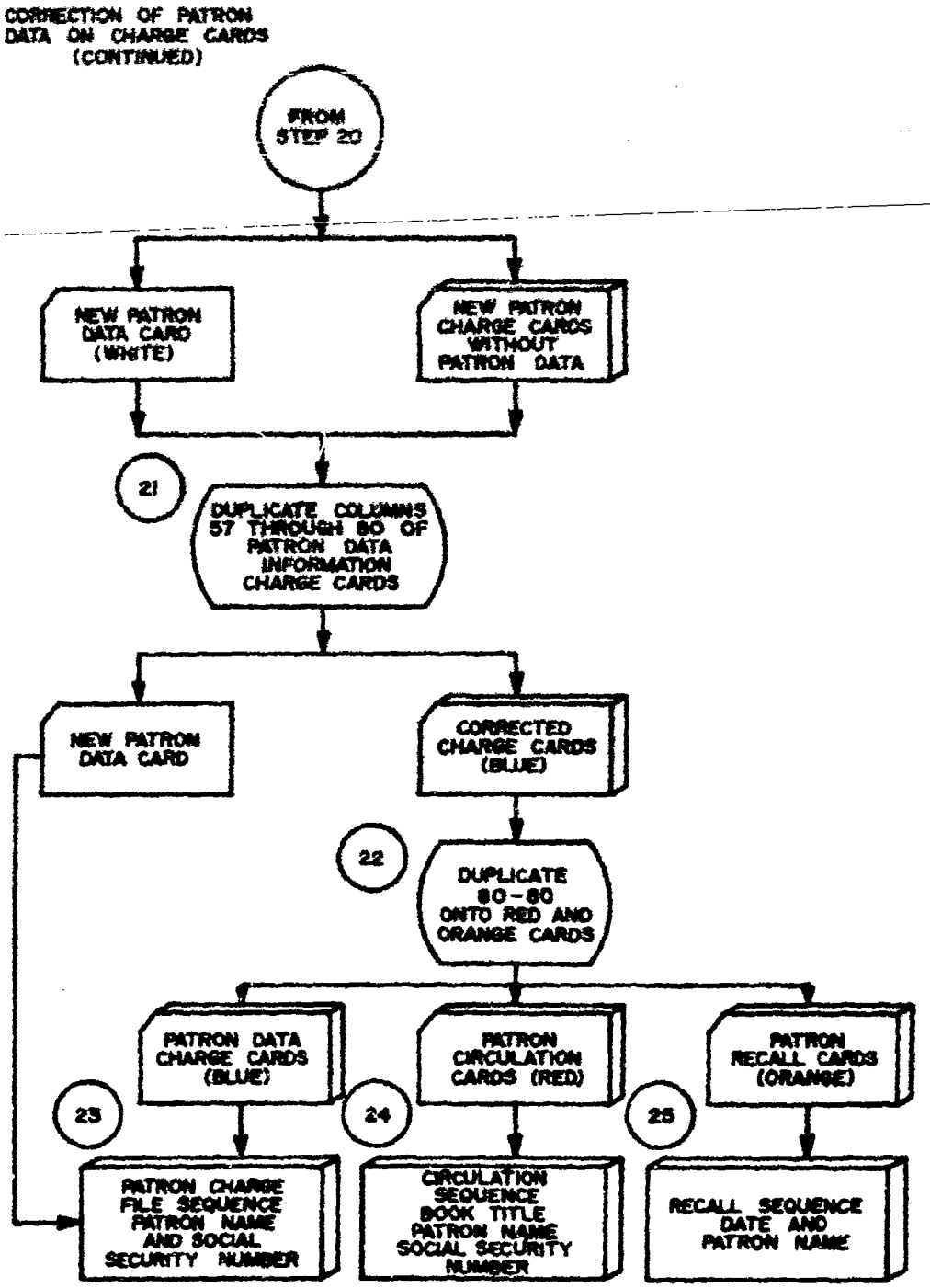


Figure 4. (Continued)

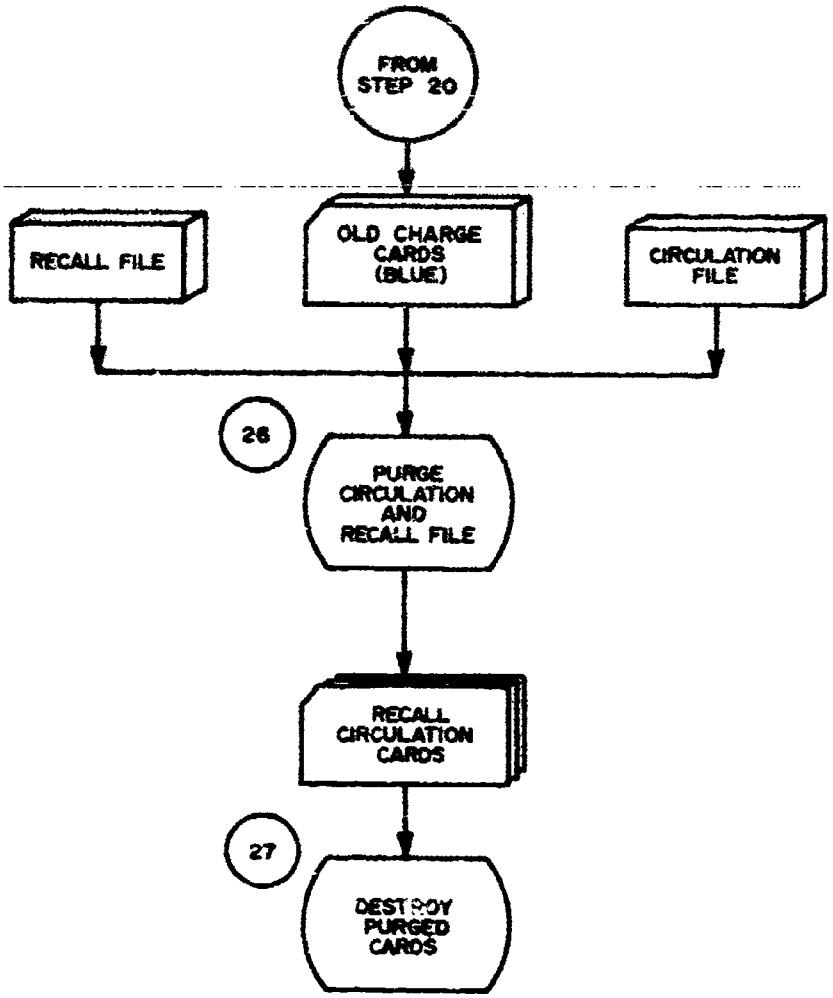


Figure 4. (Concluded)

CARDS 1-2

*ACTION 1	* CARD 2	SUF 50-52	DATE 53-56	SOC SEC NO. 57-66	SURNAME 67-78	INITIALS 79-80

CARD 1

CITIZENSHIP 3-4	PHONE NUMBER		ORGANIZATION SYMBOL OR CONTRACTOR NAME 16-33
	NUMBER 5-11	EXTENSION 12-15	

BLDG NO. 34-38	ROOM NO. 39-42	MAIL CODE (CHECK ONE) 43		PATRON TYPE (CHECK ONE) 44					
		LOCAL	BUSINESS OFFICE	ARMY	NASA	MILITARY	CIV. SERV.	CIV. SERV.	OTHER
		1	2	CONT C	CONT C	M	ARMY A	NASA N	O

SECURITY CLEARANCE (CHECK ONE) 45								TITLE 46-49
	NO CLEARANCE U		CONFIDENTIAL C		SECRET S		TOP SECRET T	

CARD 1

CARD 2

STREET ADDRESS 3-23	CITY 24-38	STATE 39-43	ZIP CODE 44-48

CARD 2

FORM 10 * DATA PROCESS CODES

Figure 5. Patron Request Card

I understand I am responsible for any material released to me. I will safeguard classified documents in accordance with current security regulations and clear Redstone Scientific Information Center prior to termination.

DATE: SIGNATURE:

Section 2 (Contractors Only)

Above individual has security clearance as shown. This employee will be required to clear Redstone Scientific Information Center when need for access is terminated.

DATE SIGNATURE (Company Security Officer)

Section 3 (Sponsor or Supervisor)

NEED-TO-KNOW (Specify subject categories in accordance with MICOM Regulation 705-7.)

APPROVED. The individual named on reverse of this card is authorized (access) (loan of material). Security clearance as shown on reverse and need-to-know as indicated above are certified.

DATE: SIGNATURE AND ORGANIZATION (Approving Authority)

Figure 6. Patron Request Card for Security Regulations

ACTION CODE	CARD CODE	BUSINESS STREET ADDRESS	CITY	STATE	ZIP CODE	BLANK	NAME SUFFIX	DATE	SOCIAL SECURITY NUMBER	SURNAME	INITIALS
1 (1)	2 (2)	3-23 (21)	24-38 (15)	39-43 (5)	44-48 (5)	49 (1)	50-52 (3)	53-56 (3)	57-66 (10)	67-78 (12)	79-80 (2)

Figure 7. Patron Data Master Card No. 2

Code	-	Country
00		Unknown
01		United States
02		Canada
03		England
04		West Germany
05		France
06		Japan
07		Spain
08		Italy
09		Turkey
10		Israel
11		Mexico
12		Portugal
13		Philippines
14		Australia
15		India
16		Greece
17		Denmark
18		Sweden
19		Norway
20		Netherlands
21		China
22		Taiwan
23		Pakistan
24		Austria
25		Argentina
26		Bolivia
28		Ireland

Figure 8. Citizenship Codes

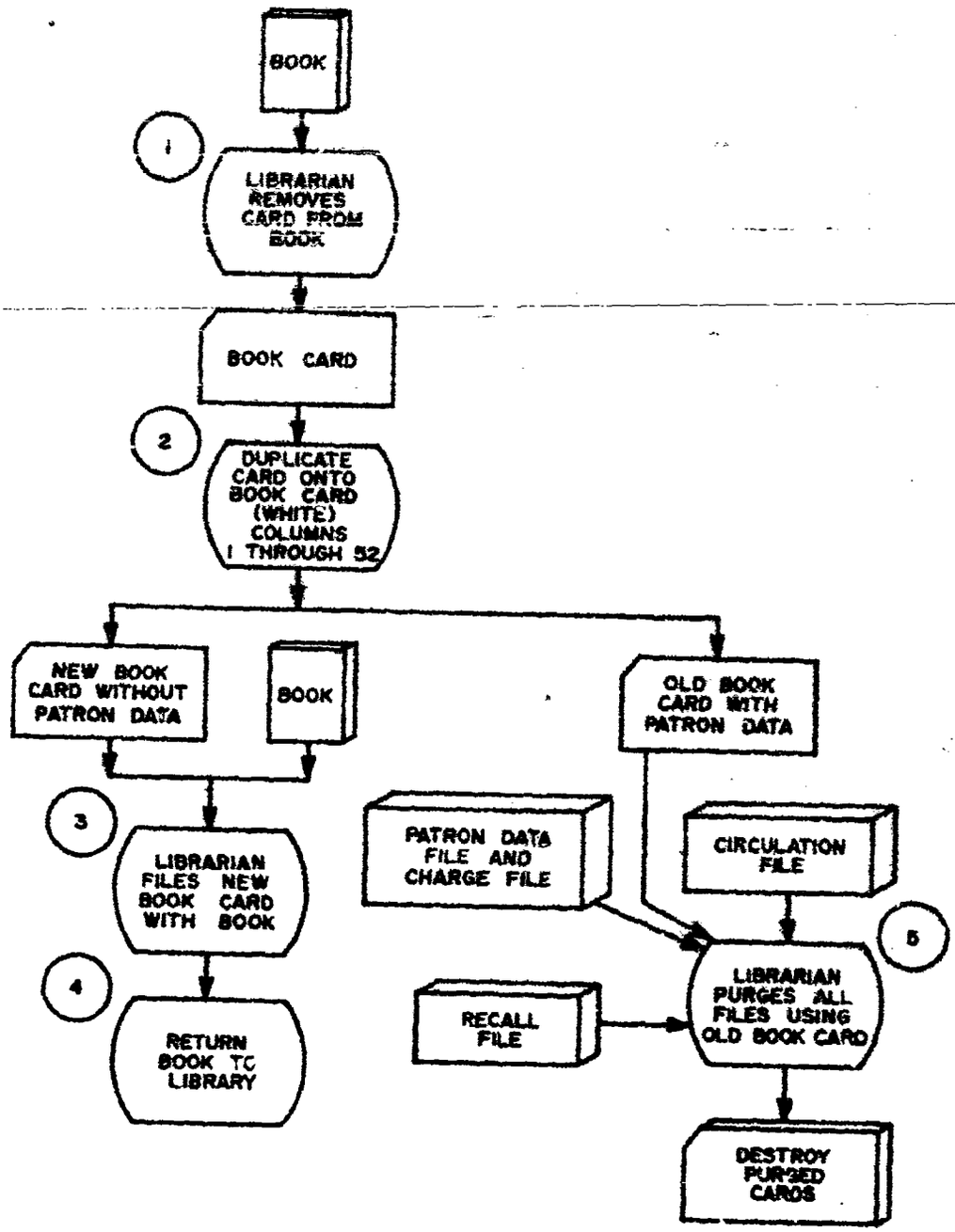


Figure 9. Processing Book Returns

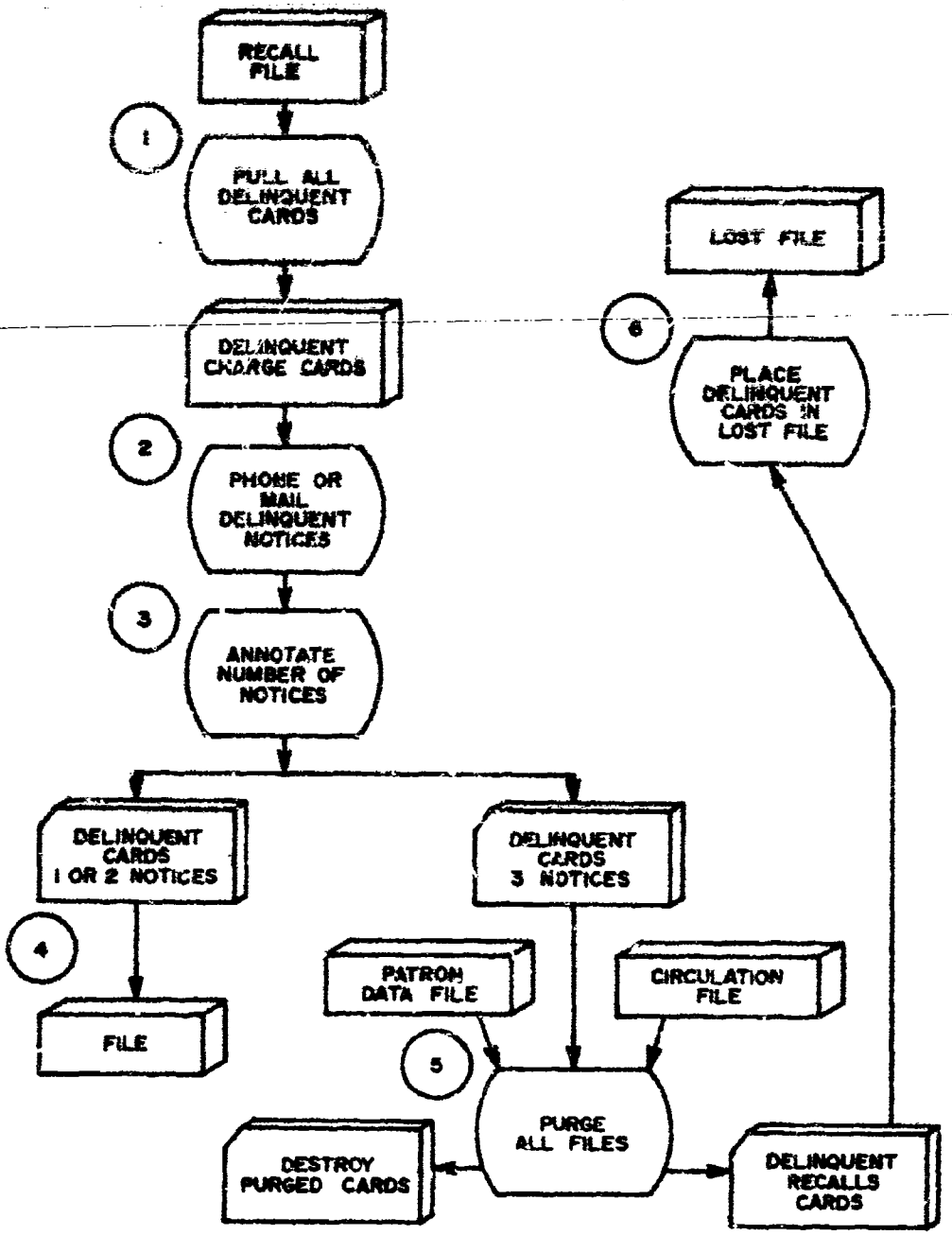


Figure 10. Processing Delinquent Recalls

Section III. PCAM CIRCULATION SYSTEM

1. Introduction and Use of PCAM Circulation System

The following represents a library circulation control system using PCAM for maintenance of files and control of book circulation. The minimum number of machines required for the process is four: a key punch, sorter, collator (40 position control), and tabulator. A reproducer punch is optional for maintaining this system. However, a reproducer punch would be practical for reproduction of files damaged through use and for duplicating files for sorting into sequences other than the normal sequence. This would preclude sorting of files back into their original sequence, since the reproduced file can be discarded after it has served its purpose.

This system is designed for use in installations of which the primary purpose is other than maintaining library functions. The cost would probably be greater than the benefits derived from the system if it were implemented solely for library control.

The PCAM circulation system is composed of the following items.

a. Patron Master File

The patron master file contains all of the patron data in two punch card formats (Figures 11 and 12). The primary purpose of the patron file is to maintain a file of authorized users of the library and to obtain the addresses of patrons for mailing overdue notices and recall notices. The file is updated through the medium of add, change, and delete transactions. The number 2 card is used to obtain mailing addresses for those patrons who desire to be contacted at their business addresses rather than at the organization or contractor address shown in card number 1. A mail code has been provided in column 43 of the number 1 card for this purpose. Code 1 refers to the address in card 1; code 2 refers to the address in card 2. (It will not be necessary to maintain a number 2 card for those patrons with a mail code of 1.)

In addition to the processes described in the accompanying procedures, the file should be listed on predesigned forms for periodic verification of patron data. This is accomplished by selecting those cards that reflect no action during a six-month period. The form should be designed with preprinted instructions as to what data is to be verified by the patron and the correction procedures to be used.

Inventory listings can also be incorporated into the system which would list all loans of books to patrons, in patron name sequence, to be submitted to the patron for verification.

Error lists generated as a result of transaction processing will consist of the following:

1) Listing of delete cards that did not match the patron file (identified as group A).
2) Listing of add cards of patrons already in file (identified as group B).
3) Listing of change cards for patrons not in file (identified as group C).

These lists must be manually checked against the patron listing and corrections must be submitted on the next process cycle.

b. Circulation Master File

The circulation master file consists of all books in the library that are on loan to authorized users of the library. The data format for the circulation file is identical to the book charge card (Figure 13). Transaction process codes are the same as those used in the small scale computer library system.

Edit errors on input data must be researched for correct punching.

Group "A" master card errors must be compared against the transaction monitor listing and appropriate action must be taken.

Group "B" unmatched return errors must be matched manually against the circulation activity list and the transaction monitor list to determine the error condition and action to be taken. (Note: New cards must be prepared prior to processing beyond this step since these errors, if not corrected, could cause additional transactions to kick out.)

Group "C" other transaction errors that did not match the file must be checked against the circulation activity list and the transaction monitor to determine the error condition and action to be taken.

Recall and overdue notices are submitted to the patron for return of books to the library. Books that have been recalled for reprocessing should contain the patron charge card when sent to reprocessing. Upon return from processing, a new patron charge card can be made and book recirculated to the patron, if required.

The date of the initial loan must be punched in all subsequent transactions (lost, found, recall, and return) to assure correct batch processing.

The entire circulation card must be punched for all transactions that affect circulation processing.

Name and social security changes can be made to the circulation file.

Care should be exercised when multiple transactions are processed on the same call number for the same date (that is, loan of a book, return of the book, and loan of the book on the same date to another patron). This action could result in merging the wrong loan card into the circulation file.

The processing procedures for patron file maintenance describe the flow of data for maintaining the patron file (Figure 14). The processing procedures for circulation file maintenance describe the flow of data through the circulation system. Brief discussions are furnished to explain processing.

2. Processing Procedures for Patron File Maintenance

Processing procedures are as follows:

1) Patron transactions are accumulated and processed on a weekly basis.
2) Preparation of data to add a patron is identical to the input for the small scale patron control system.
3) Processing of changes to the patron file requires that changes affecting the patron record (cards 1 and 2) be punched completely for changing data in the patron file, since any changes to the cards in the file will require replacing of the old card in the file with the new change. Changes to name and social security number will require a delete transaction (one card) and an add transaction of both the 1 and 2 patron cards.
4) Delete transactions require that a number 1 patron card be prepared consisting of social security number, name, and initials.

5) Editing of patron data is not shown in the flow chart. When sorting the control data, the following rules should apply:

   a) Column 2, card codes, should be numeric digits 1 or 2.
   b) Columns 53 through 56, date, should be numeric.
   c) Columns 67 through 80, name and initials, should be alphabetic.
   d) Columns 57 through 66, social security number, should be numeric.
   e) Column 1, action code, should be A, C, or D.

6) Processing errors from updating will include adding a patron already in file, changing of patron data not in file, and deleting of patrons not in file. These error conditions must be researched for incorrect punching of control data.
7) Outputs of the patron system will consist of error cards and a complete listing of patron data. See Figures 15 and 16 for print format.

3. Processing Procedures for Circulation File Maintenance

Processing procedures are as follows:

1) Circulation transactions are accumulated and processed on a weekly basis.
2) Data formats for input to maintain the book circulation file (Figure 17) are identical to the small scale computer library system. The circulation file contains those books that are in circulation and the status of each book in circulation.
3) To reduce processing time, the transactions after edit and sequencing are passed against the circulation file on call number selecting all matching cards reflecting activity for the weekly period. This precludes the necessity of passing the entire circulation file for processing the various types of transactions.
4) Outputs from the system include:

   a) Edit errors on input data.
   b) Master card errors that did not match on date (group A).
   c) Unmatched returns that did not match on date (group B).

d) Other transaction errors that did not match on date or call number in circulation masters (group C).
e) Recall and overdue loan notices.

5) Refer to Paragraph 1 of this section for error correction and report handling. For report format see Figure 18; request for recall or overdue notice is shown in Figure 19.

ACTION CODE	CARD CODE	CITIZENSHIP	PHONE NUMBER		CONTRACTOR NAME 16-42											
			PHONE NUMBER	EXTENSION	ORGANIZATION SYMBOL	BUILDING NUMBER	ROOM NUMBER	MAIL	TYPE PATRON	SECURITY CLEARANCE	TITLE/OR GRADE	NAME SUFFIX	DATE	SOCIAL SECURITY NUMBER	SURNAME	INITIALS
1 (1)	2 (1)	3-4	5-11 (7)	12-15 (4)	16-33	(5) 34-38	(4) 39-42	43	44	(1) 45	(1) 46-49	(3) 50-52	53-56	57-66 (10)	67-78 (12)	(2) 79-80

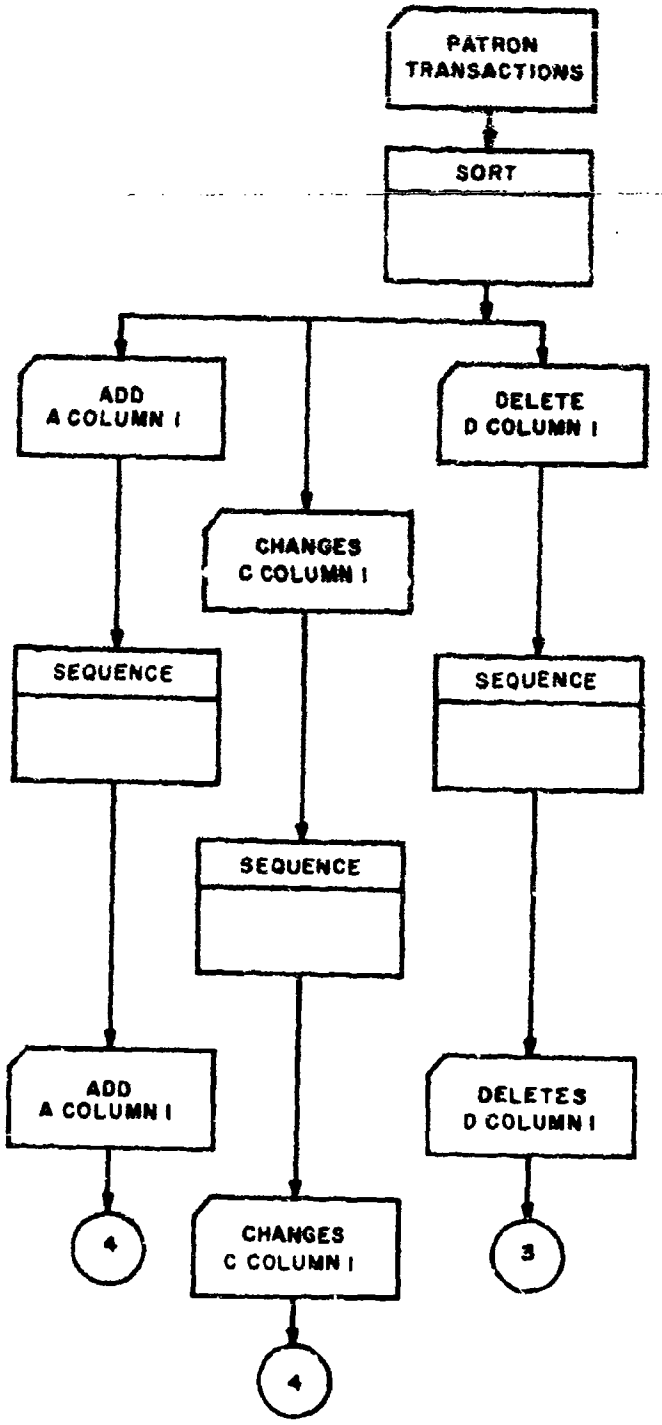
Figure 11. Patron Data Master Card No. 1

ACTION CODE	CARD CODE	BUSINESS STREET ADDRESS	CITY	STATE	ZIP CODE	BLANK	NAME SUFFIX	DATE	SOCIAL SECURITY NUMBER	SURNAME	INITIALS
1 (1)	2 (2)	3-23 (21)	24-38 (15)	39-43 (5)	44-48 (5)	49 (1)	(3) 50-52	(3) 53-56	57-66 (10)	67-78 (12)	(2) 79-80

Figure 12. Patron Data Master Card No. 2

ACTION CODE	CALL NUMBER AUTHOR/TITLE	SECURITY CODE	TYPE LOAN	LOAN DATE	SOCIAL SECURITY NUMBER	SURNAME	INITIALS
1 (1)	2-50 (49)	51 (1)	52 (1)	(1) 53-56	57-66 (10)	67-78 (12)	(2) 79-80

Figure 13. Book Circulation Card



(1) SORT PATRON TRANSACTIONS FROM MINOR TO MAJOR AS FOLLOWS:

a. COLUMN 2, CARD CODE, NUMERIC
b. COLUMNS 53-56, DATE, NUMERIC
c. COLUMNS 67-80, NAME, ALPHA
d. COLUMNS 57-66, SOCIAL SECURITY NO., NUMERIC
e. COLUMN 1, ACTION CODE, ALPHA

NOTE: HOLD CARDS SEPARATE AFTER COLUMN 1 SORT.

(2) SEQUENCE CHECK EACH GROUP OF CARDS AS FOLLOWS:

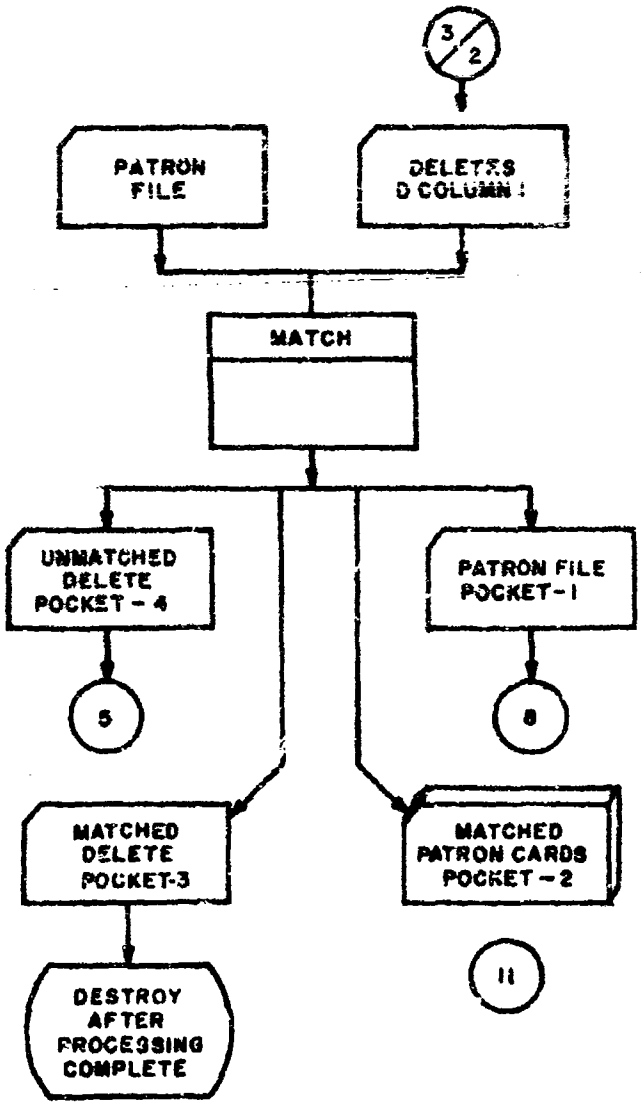
MAJOR 57 THROUGH 66, SOCIAL SECURITY NUMBER

INTERMEDIATE 67 THROUGH 80, NAME

INTERMEDIATE-1 53 THROUGH 56, DATE

MINOR 2, CARD CODE

Figure 14. Patron File Maintenance



3 MATCH THE DELETE TRANSACTIONS WITH THE PATRON FILE AS FOLLOWS ON

57 THROUGH 66, SOCIAL SECURITY NUMBER, MAJOR

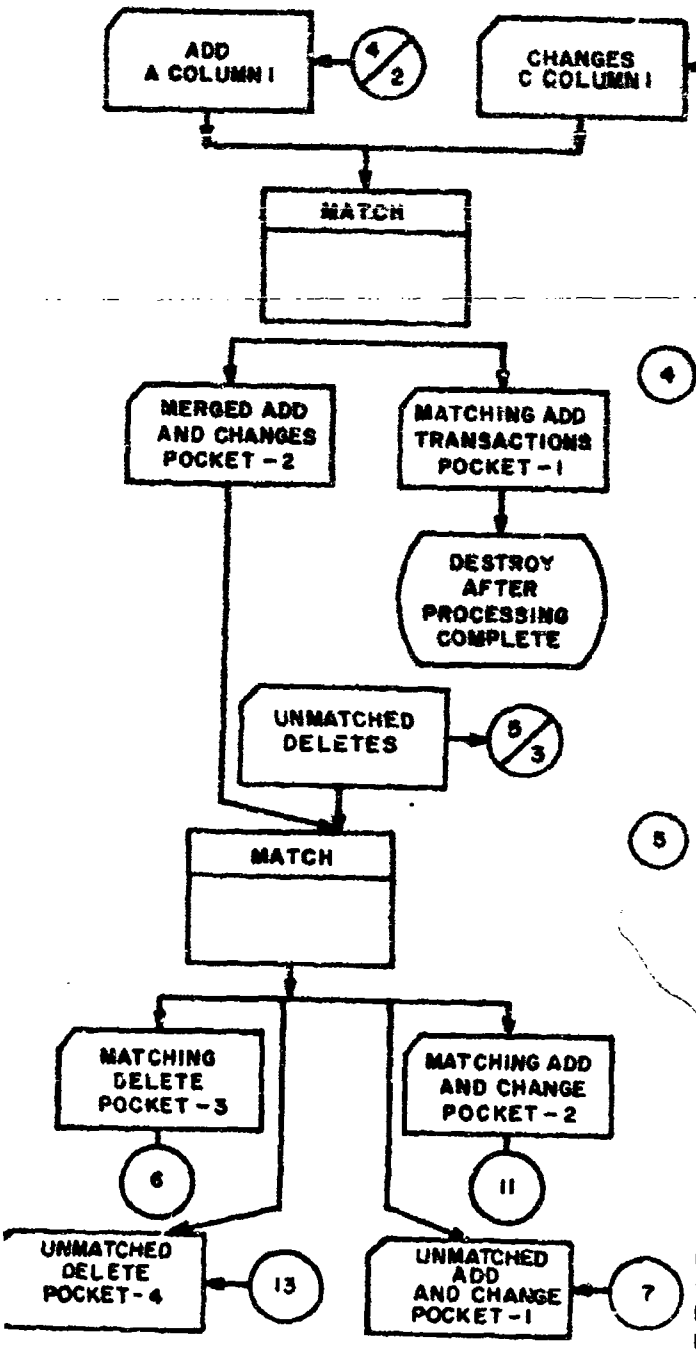
67 THROUGH 80, NAME, INTERMEDIATE

PRIMARY FEED - PATRON FILE

SECONDARY FEED - DELETES

POCKET - 1 UNMATCHED PATRON
POCKET - 2 MATCHED PATRON
POCKET - 3 MATCHED DELETE
POCKET - 4 UNMATCHED DELETE

Figure 14. (Continued)



(4) MATCH THE CHANGE TRANSACTIONS WITH THE ADD TRANSACTIONS AS FOLLOWS:

57 THROUGH 66, SOCIAL SECURITY NUMBER, MAJOR

67 THROUGH 80, NAME, INTERMEDIATE

2, CARD CODE, MINOR

PRIMARY FEED - ADD TRANSACTIONS
SECONDARY FEED - CHANGE TRANSACTIONS
POCKET - I MATCHING
POCKET - 2 MERGED ADDS AND CHANGES

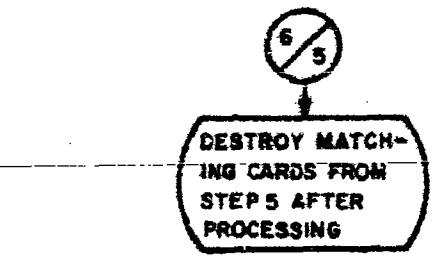
(5) MATCH THE UNMATCHED DELETES WITH THE MERGED ADD AND CHANGE TRANSACTIONS AS FOLLOWS:

57 THROUGH 66, SOCIAL SECURITY NUMBER, MAJOR
67 THROUGH 80, NAME, INTERMEDIATE

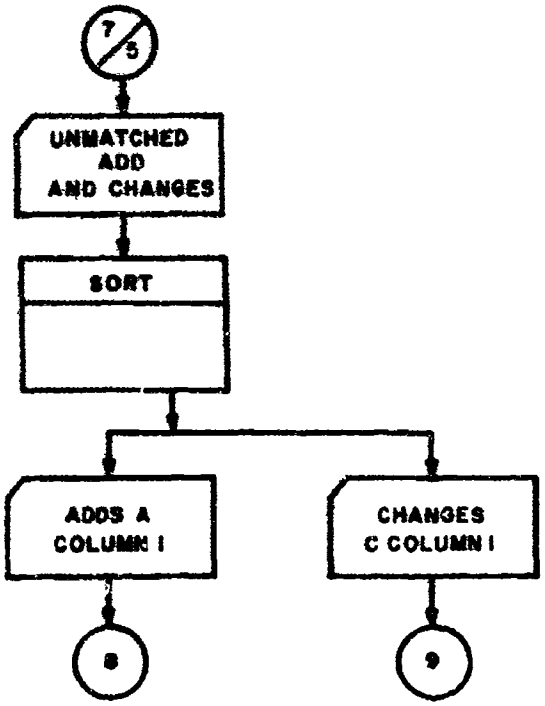
PRIMARY FEED - ADD AND CHANGE TRANSACTIONS
SECONDARY FEED - DELETE (UNMATCHED)

POCKET - I UNMATCHED ADD AND CHANGE
POCKET - 2 MATCHED ADD AND CHANGE
POCKET - 3 MATCHING DELETE
POCKET - 4 UNMATCHED DELETE

Figure 14. (Continued)

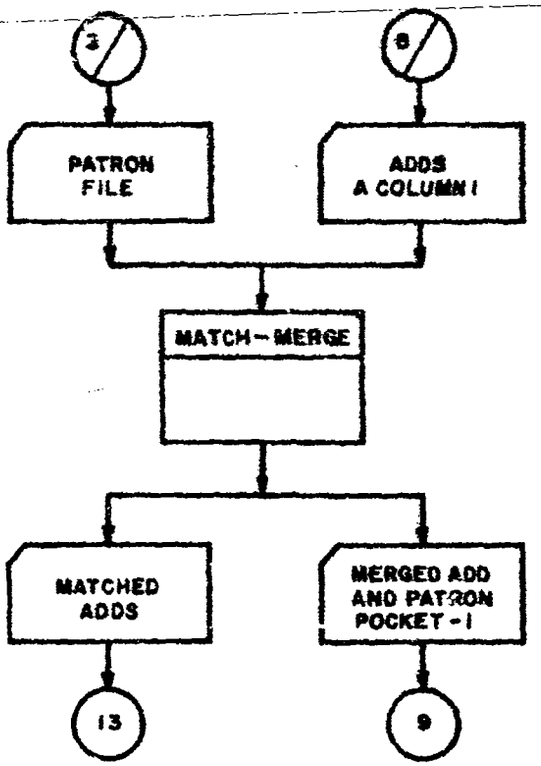


6 DESTROY MATCHING DELETE TRANSACTIONS FROM STEP 5 AFTER PROCESSING IS COMPLETE.



7 SEPARATE THE ADDS FROM THE CHANGES ON COLUMN I.

Figure 14. (Continued)



8 MATCH MERGE THE ADD TRANSACTION WITH THE PATRON FILE AS FOLLOWS:

56 THROUGH 66, SOCIAL SECURITY NUMBER, MAJOR

67 THROUGH 80, NAME INTERMEDIATE

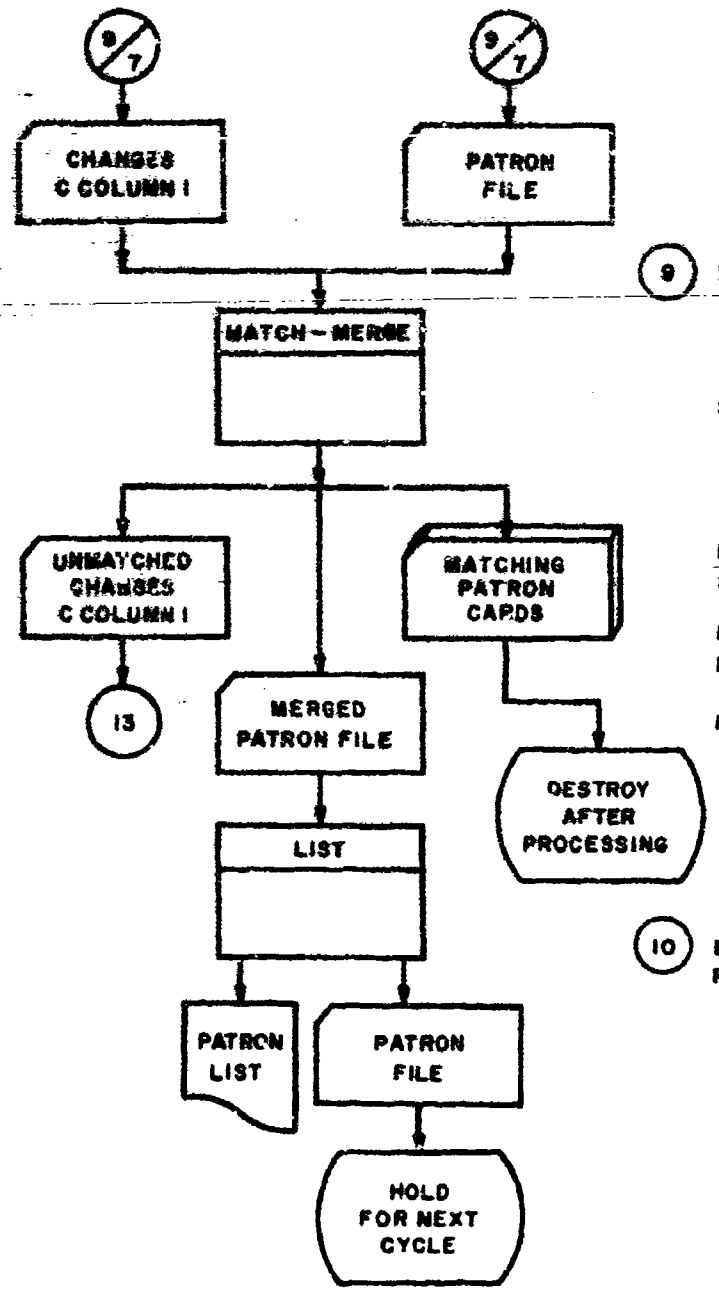
2, CARD CODE, MINOR

PRIMARY FEED - PATRON FILE
SECONDARY FEED - ADD TRANSACTION

POCKET - 2 MERGED ADD AND PATRON

POCKET - 3 MATCHED ADD TRANSACTION

Figure 14. (Continued)



(9) MATCH MERGE THE CHANGES WITH THE PATRON FILE AS FOLLOWS:

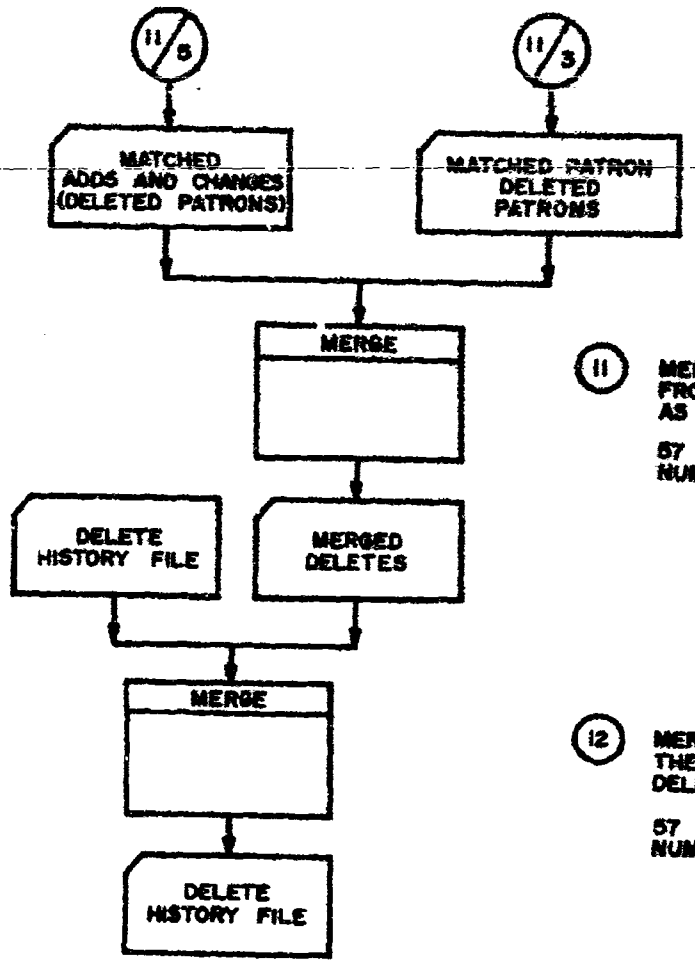
57 THROUGH 66, SOCIAL SECURITY NUMBER, MAJOR
67 THROUGH 80, NAME, INTERMEDIATE
2, CARD CODE, MINUS

PRIMARY FEED – PATRON FILE
SECONDARY FEED – CHANGES

POCKET – 1 MATCHING PATRON
POCKET – 2 MERGED PATRON CHANGES
POCKET – 3 UNMATCHED CHANGES

(10) LIST THE PATRON FILE PREPARING A PATRON MASTER LIST.

Figure 14. (Continued)



(11) MERGE THE DELETED PATRONS FROM STEPS 3 AND 5 TOGETHER AS FOLLOWS:

57 THROUGH 66, SOCIAL SECURITY NUMBER, MAJOR

(12) MERGE THE DELETE ACTIONS FOR THE WEEKLY PERIOD WITH THE DELETE HISTORY FILE.

57 THROUGH 66, SOCIAL SECURITY NUMBER, MAJOR

Figure 14. (Continued)

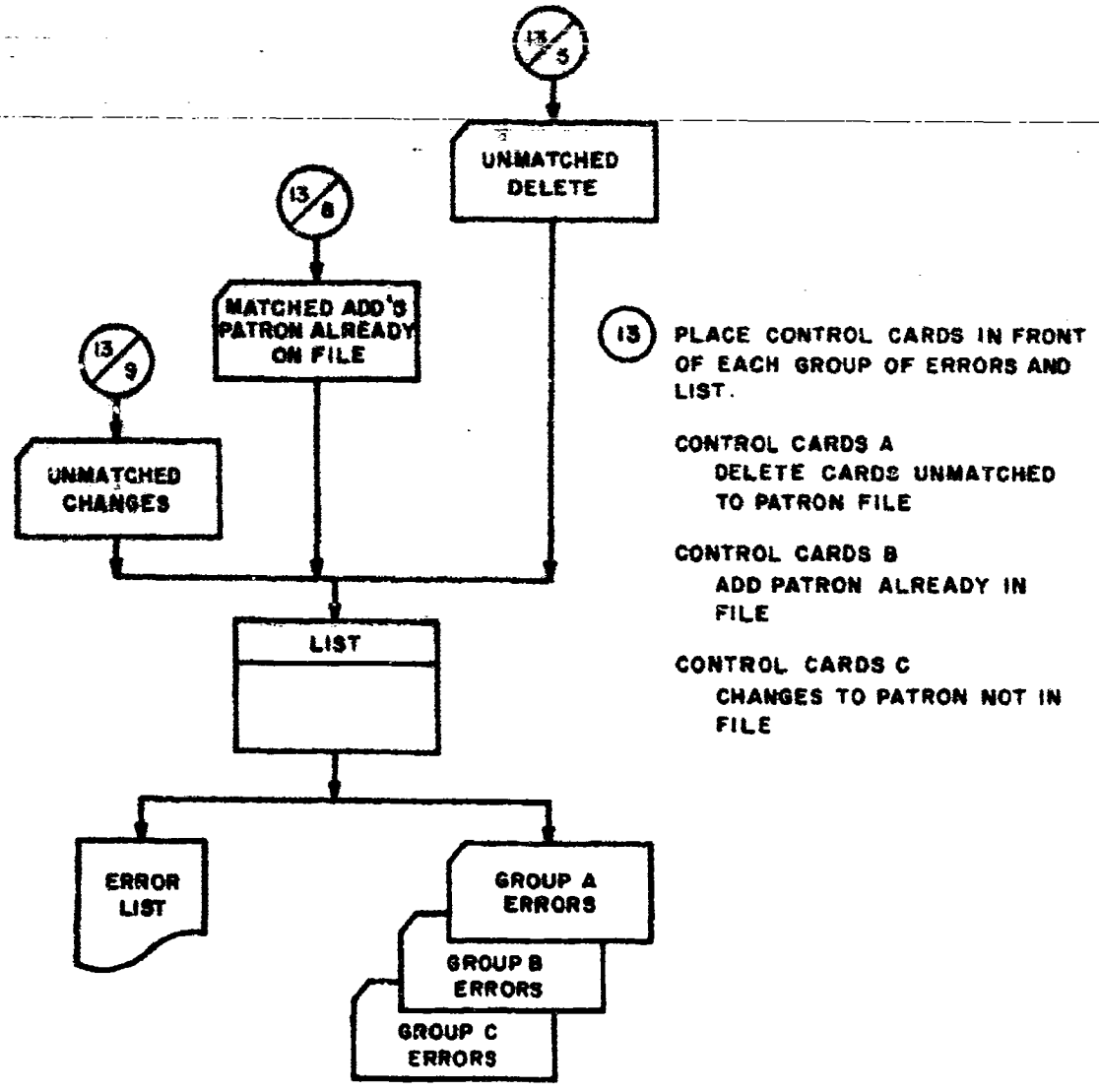


Figure 14. (Concluded)

PATRON FILE PRINT FORMAT

CARD 1 DESCRIPTION	CARD COLUMNS	PRINT POSITIONS
ACTION CODE	1	3
CARD CODE	2	8
CITIZENSHIP	3 - 4	11 - 12
PHONE	5 - 11	14 - 20
EXTENSION	12 - 15	22 - 25
ORGANIZATION-CONTRACTOR	16 - 33	28 - 46
BUILDING NUMBER	34 - 38	48 - 52
ROOM NUMBER	39 - 42	54 - 57
MAIL CODE	43	60
TYPE PATRON	44	65
SECURITY CLEARANCE	45	68
TITLE OR GRADE	46 - 49	70 - 73
NAME SUFFIX	50 - 52	76 - 78
DATE	53 - 56	82 - 85
SOCIAL SECURITY NO.	57 - 66	88 - 97
SURNAME	67 - 78	100 - 111
INITIALS	79 - 80	113 - 114

Figure 15. Patron File Print Format, Card No. 1

PATRON FILE PRINT FORMAT (CONT'D)

CARD 2 DESCRIPTION	CARD COLUMNS	PRINT POSITIONS
ACTION CODE	1	3
CARD CODE	2	8
STREET ADDRESS	3 - 23	11 - 31
CITY	24 - 38	33 - 47
STATE	39 - 43	49 - 53
ZIP CODE	44 - 48	55 - 59
NAME SUFFIX	50 - 52	76 - 78
DATE	53 - 56	82 - 85
SOCIAL SECURITY NO.	57 - 66	88 - 97
SURNAME	67 - 78	100 - 111
INITIALS	79 - 80	113 - 114

Figure 16. Patron File Print Format, Card No. 2

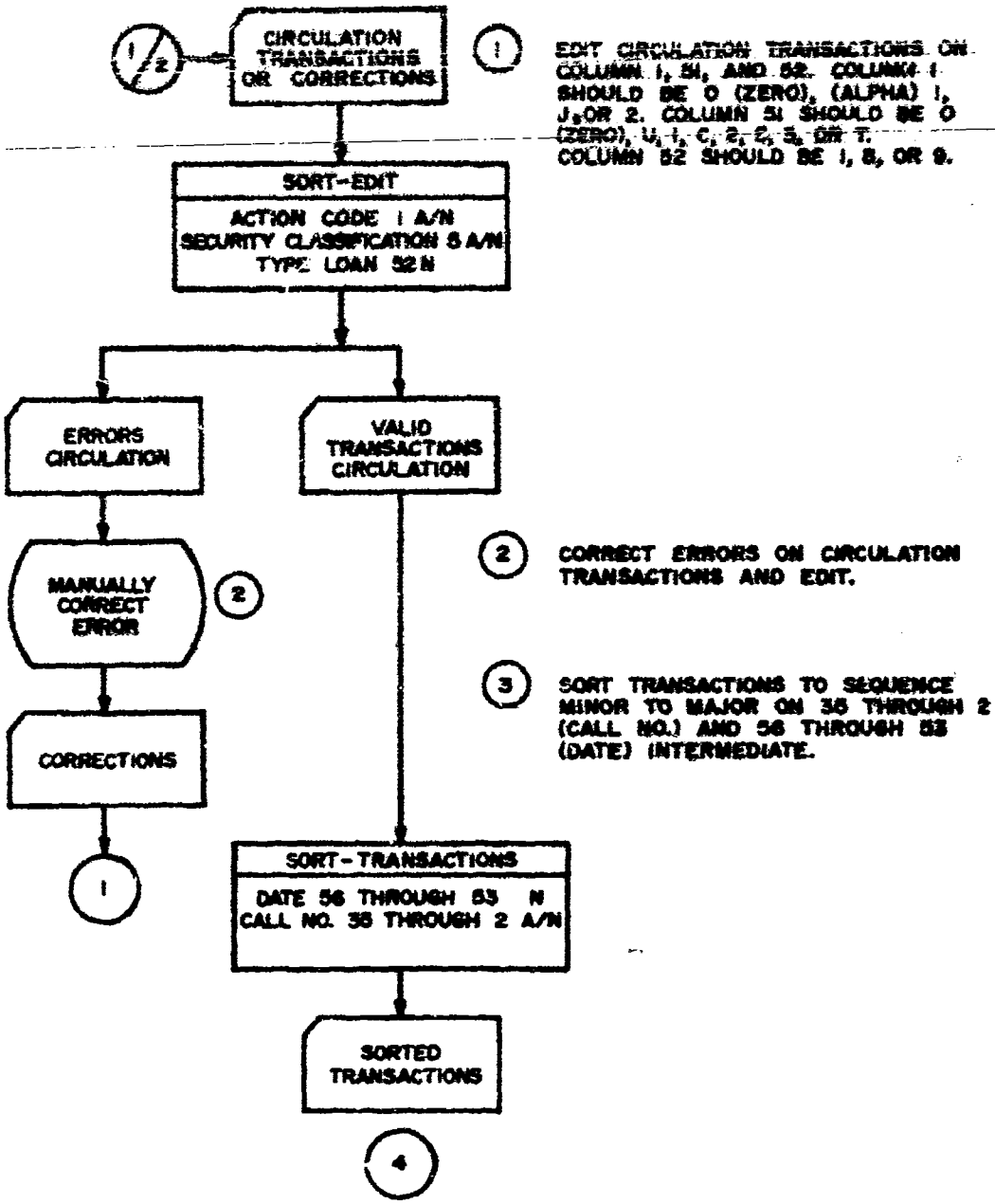


Figure 17. Circulation File Maintenance

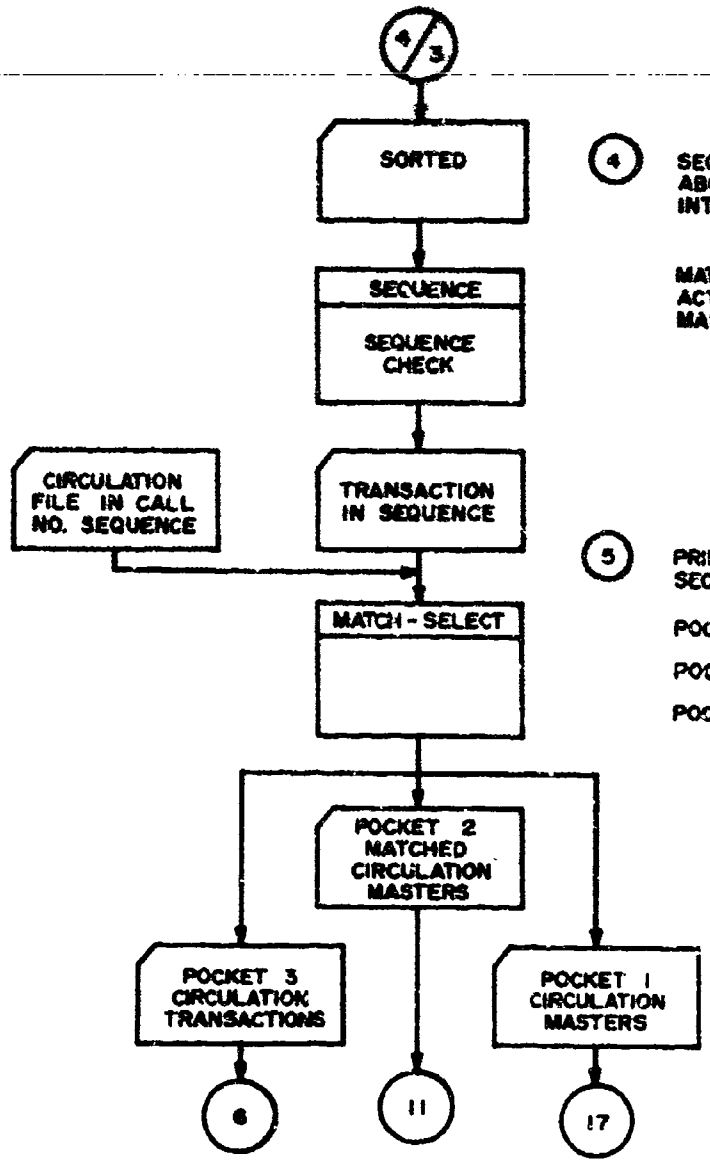


Figure 17. (Continued)

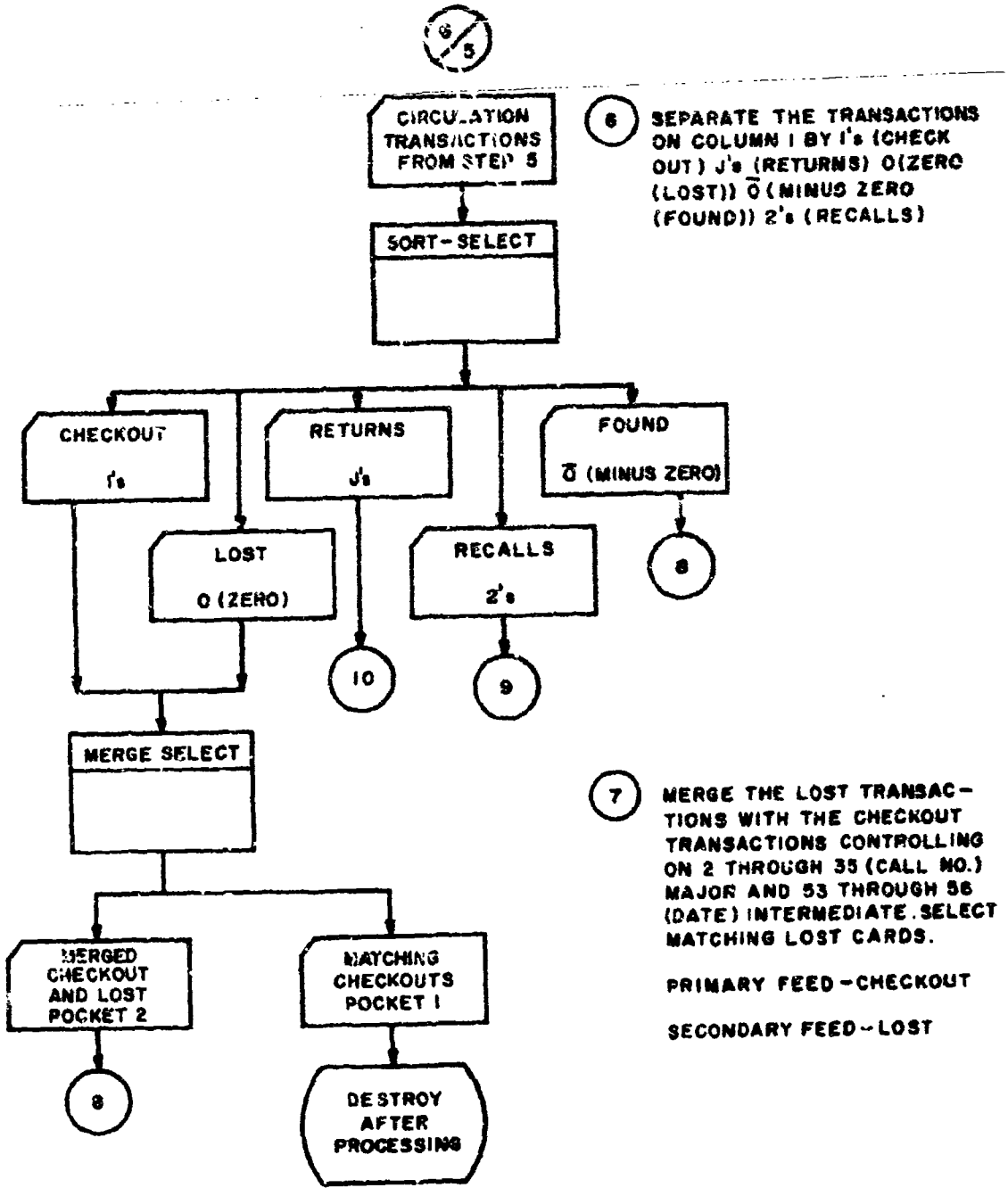


Figure 17. (Continued)

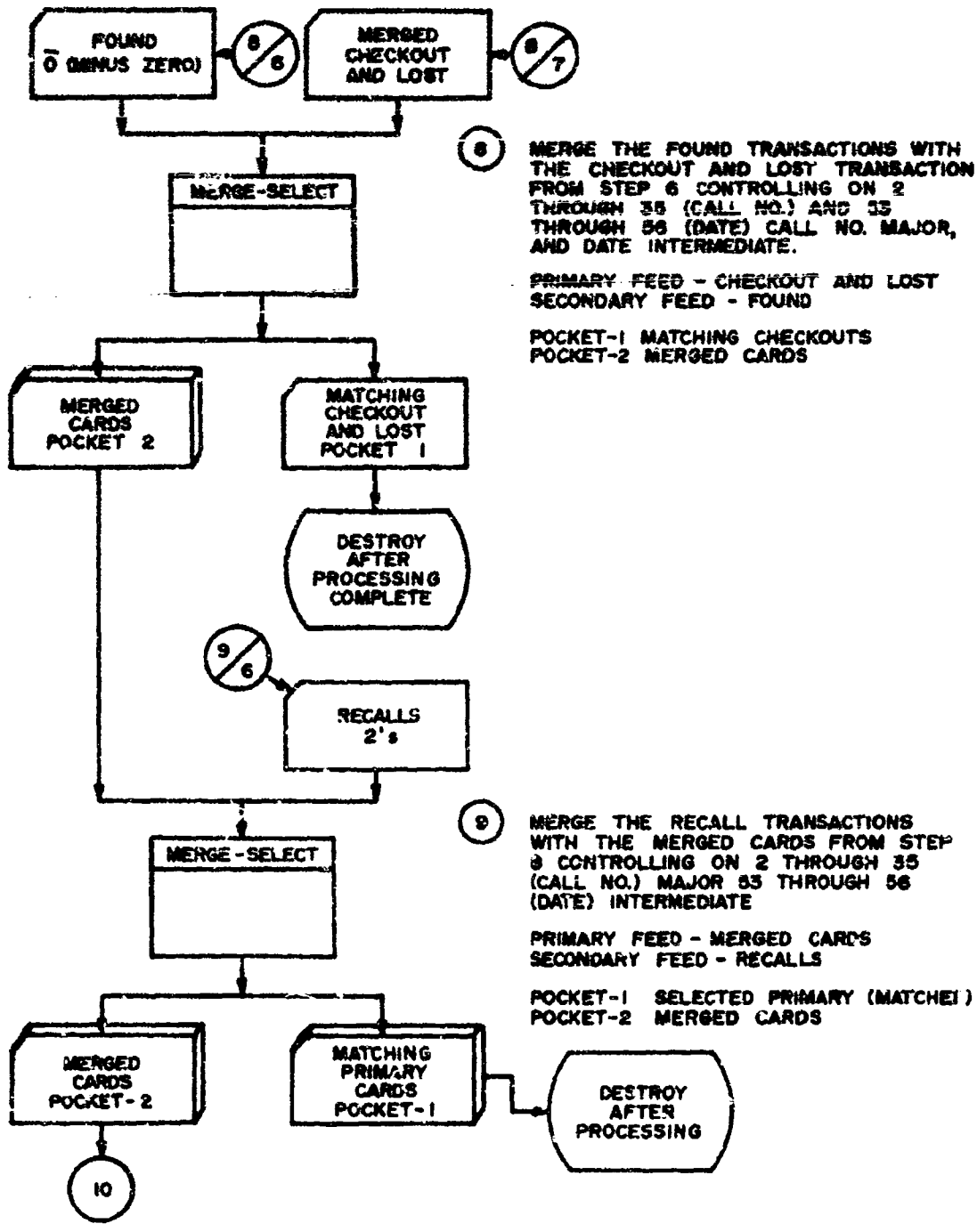


Figure 17. (Continued)

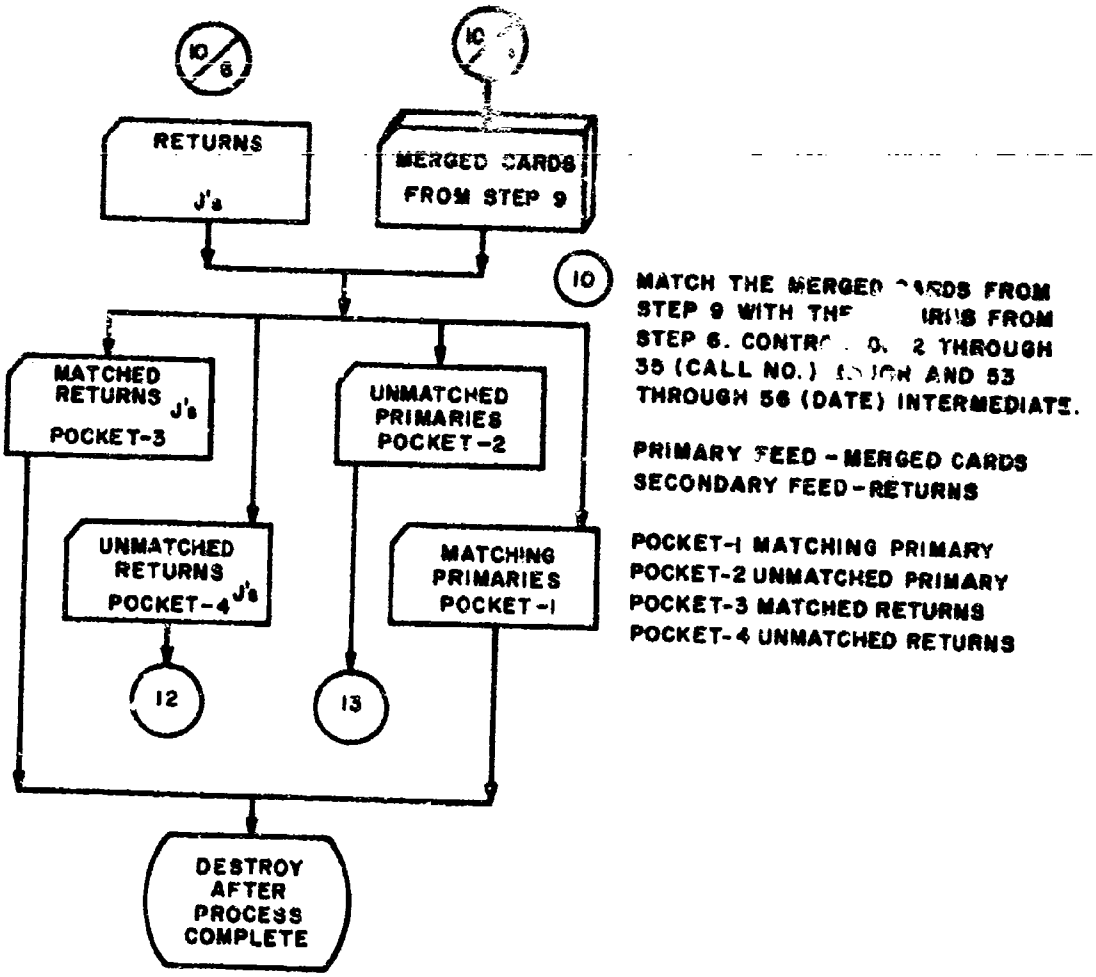


Figure 17. (Continued)

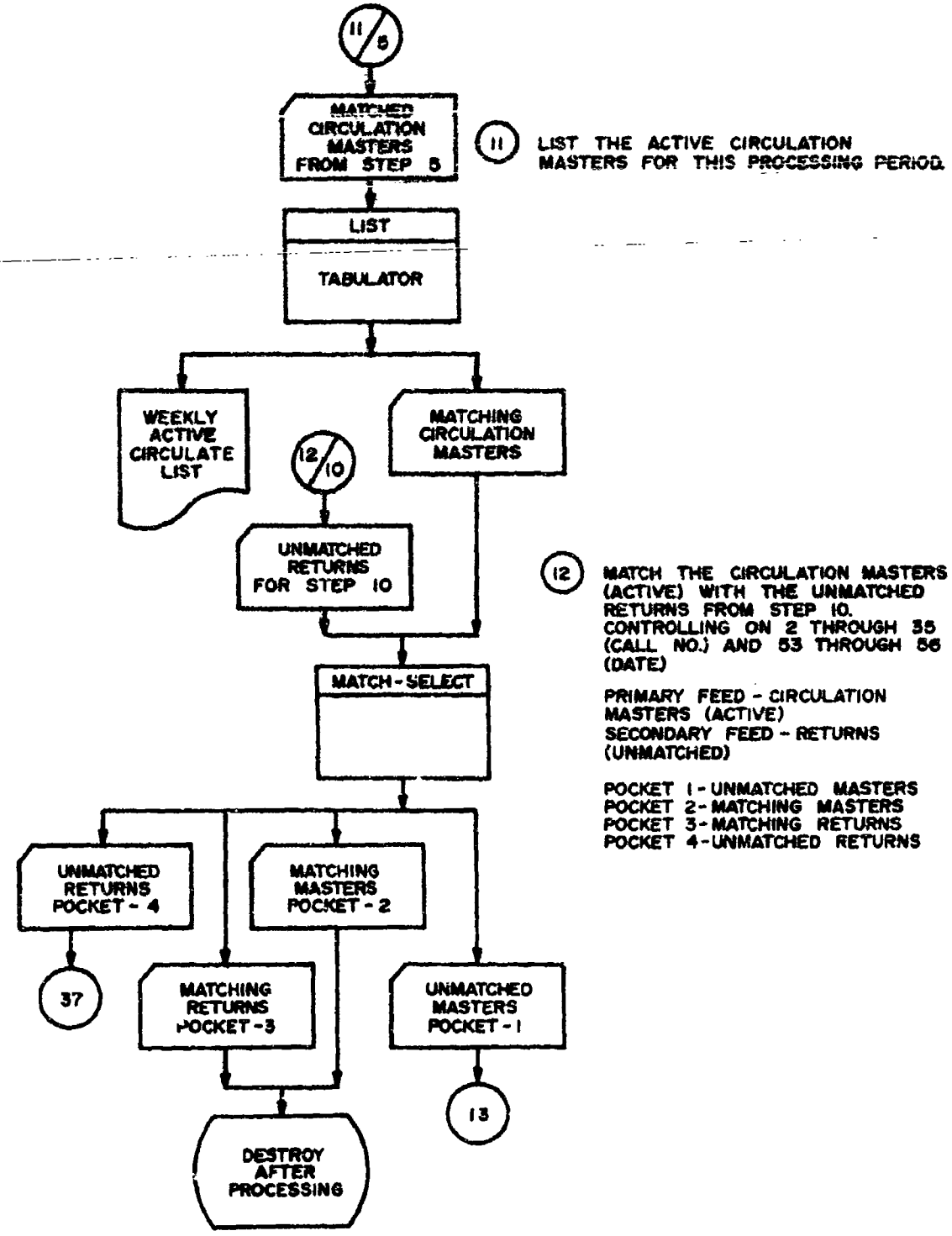
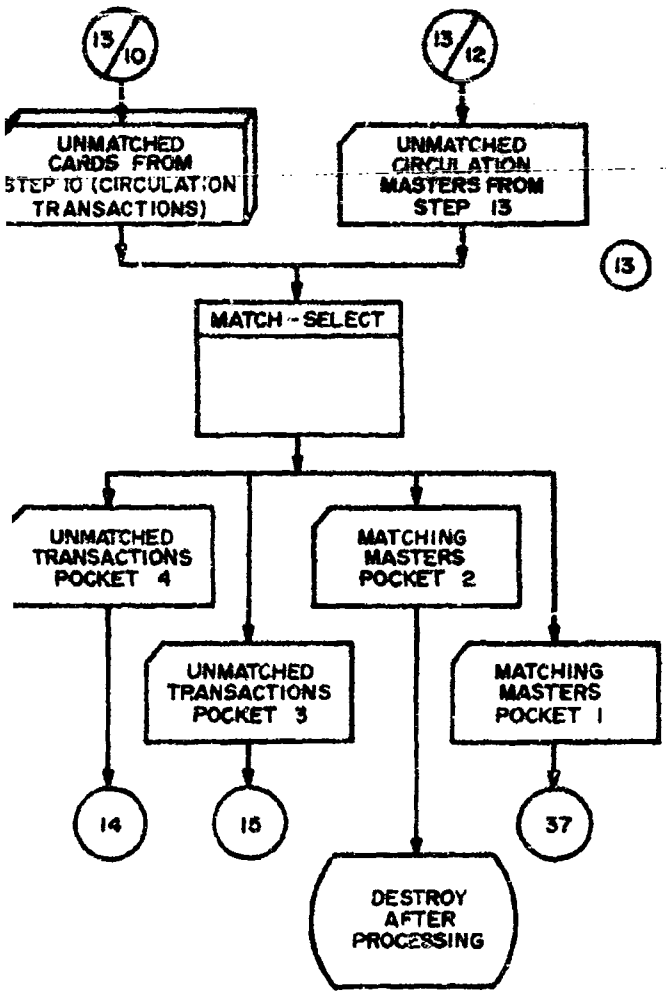


Figure 17. (Continued)



(13) MATCH SELECT THE CIRCULATION MASTERS (UNMATCHED) FROM STEP 12 WITH THE CIRCULATION TRANSACTIONS (UNMATCHED) FROM STEP 10. CONTROLLING ON 2 THROUGH 35 (CALL NO.) AND 53 THROUGH 56 (DATE).

PRIMARY FEED - CIRCULATION MASTERS
SECONDARY FEED - CIRCULATION TRANSACTIONS

POCKET 1 UNMATCHED MASTERS
POCKET 2 MATCHING MASTERS
POCKET 3 MATCHING TRANSACTIONS
POCKET 4 UNMATCHED TRANSACTIONS

Figure 17. (Continued)

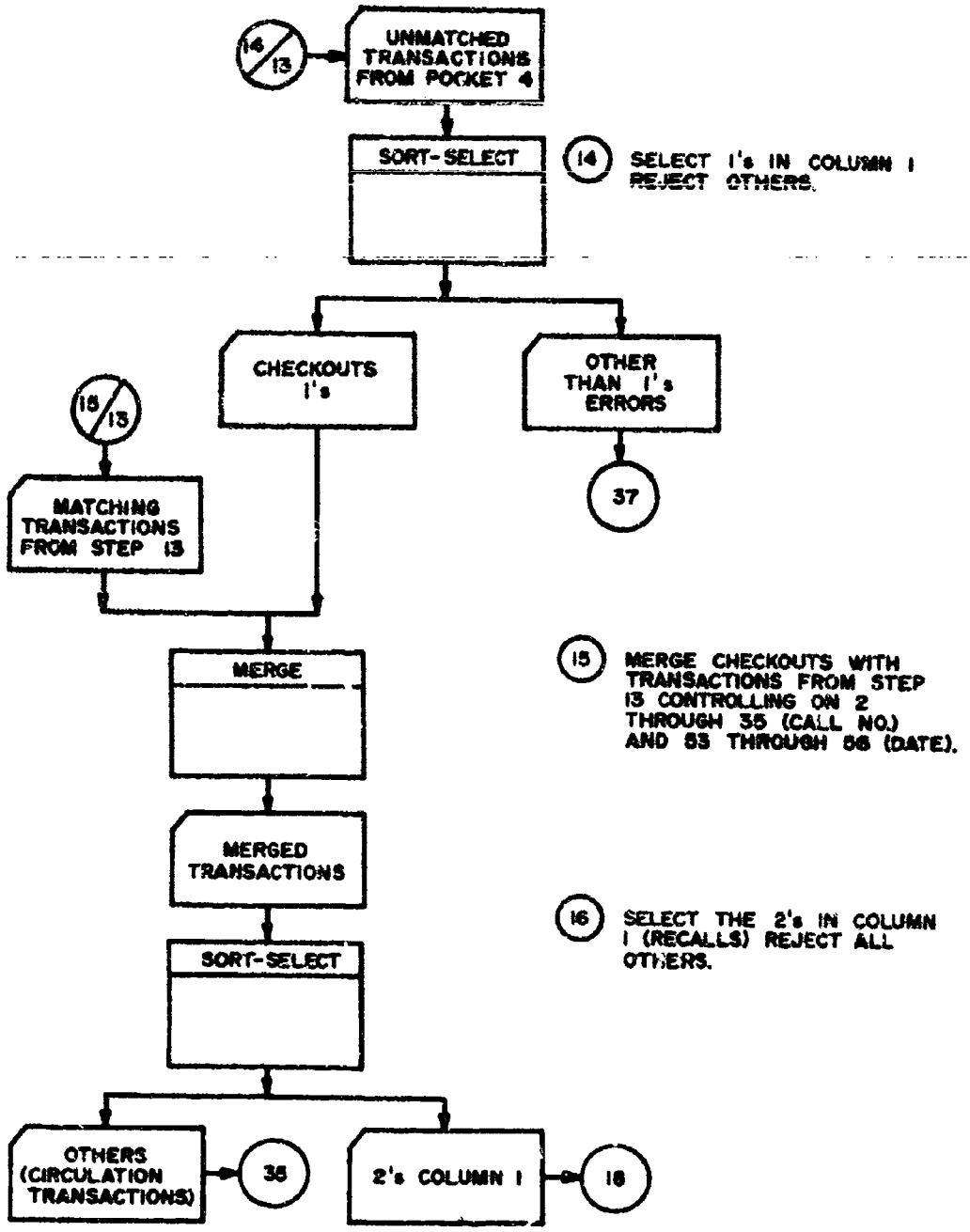


Figure 17. (Continued)

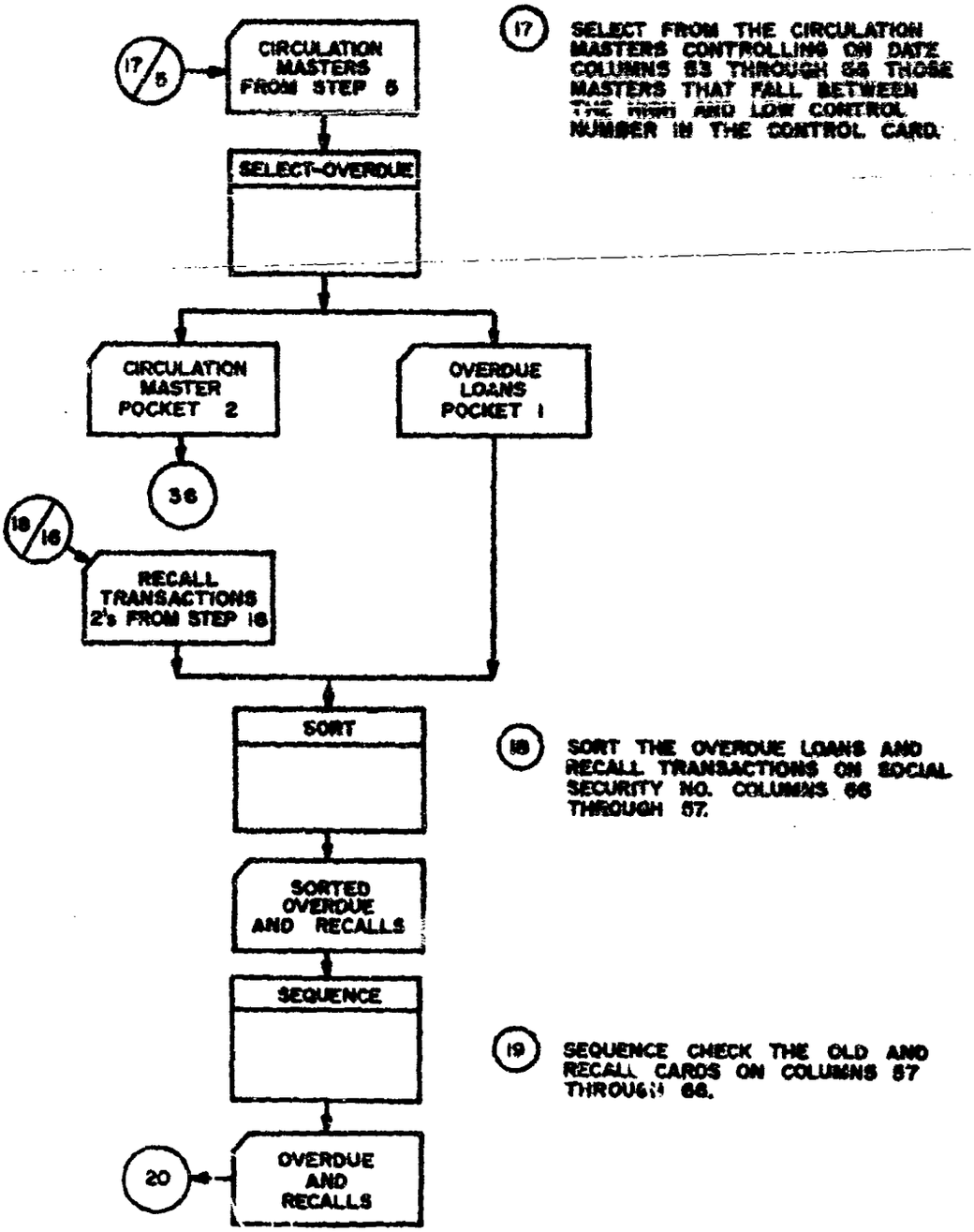
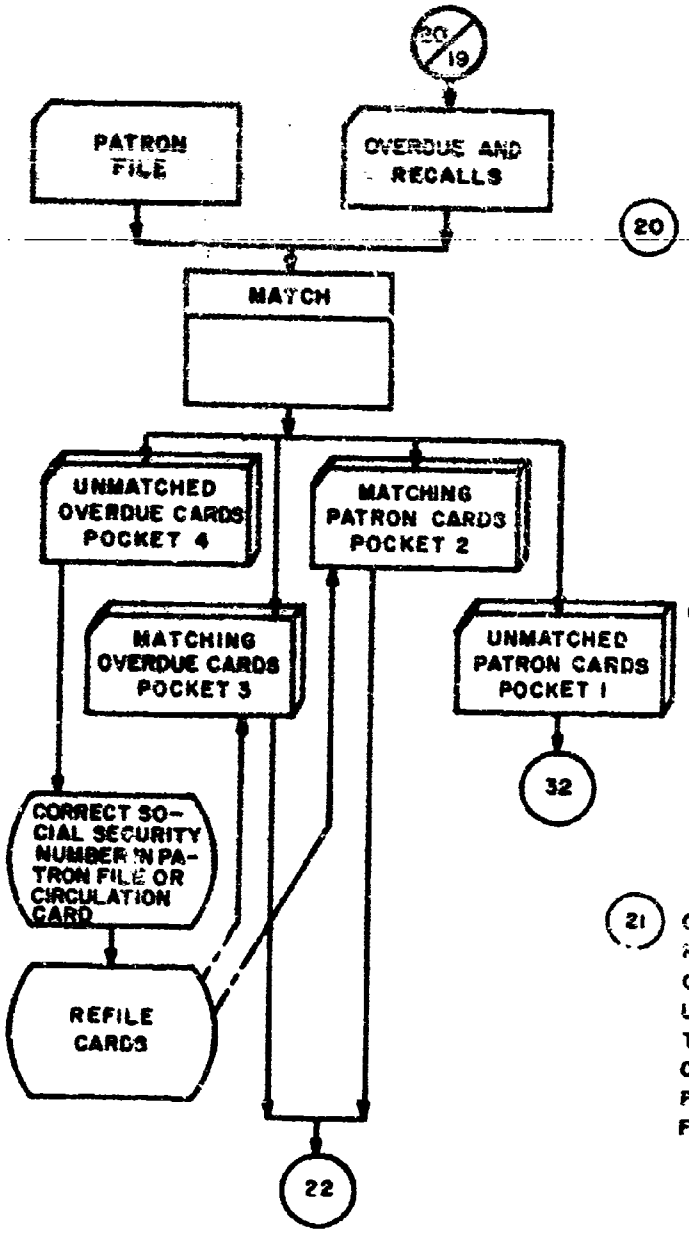


Figure 17. (Continued)



20 MATCH THE PATRON FILE WITH THE OVERDUE AND RECALLS SELECTING UNMATCHED CARDS FROM BOTH FEEDS.

PRIMARY FEED – PATRON DATA CARDS

SECONDARY FEED – OVERDUE AND RECALLS

POCKET 1 – UNMATCHED PATRON
POCKET 2 – MATCHING PATRONS
POCKET 3 – MATCHING OVERDUE AND RECALL
POCKET 4 – UNMATCHED OVERDUE NOTICES AND RECALLS

21 CORRECT THE SOCIAL SECURITY NUMBER IN THE PATRON CARD OR CIRCULATION CARD. MANUALLY MATCH THIS CIRCULATION CARD WITH THE PATRON CARD AND REFILE WITH CARDS FROM POCKETS 2,3 OF OUTPUT FROM STEP 20.

Figure 17. (Continued)

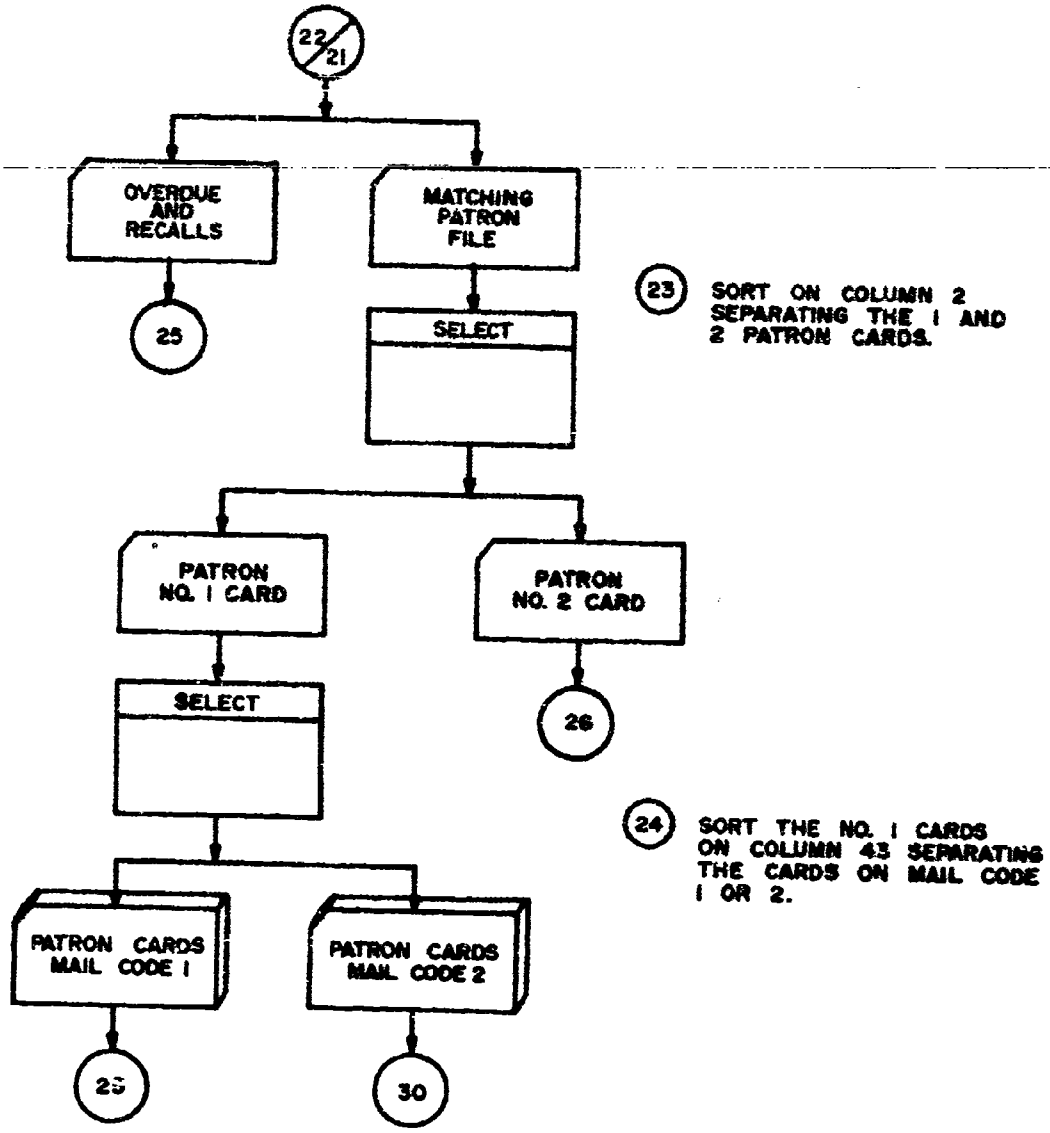


Figure 17. (Continued)

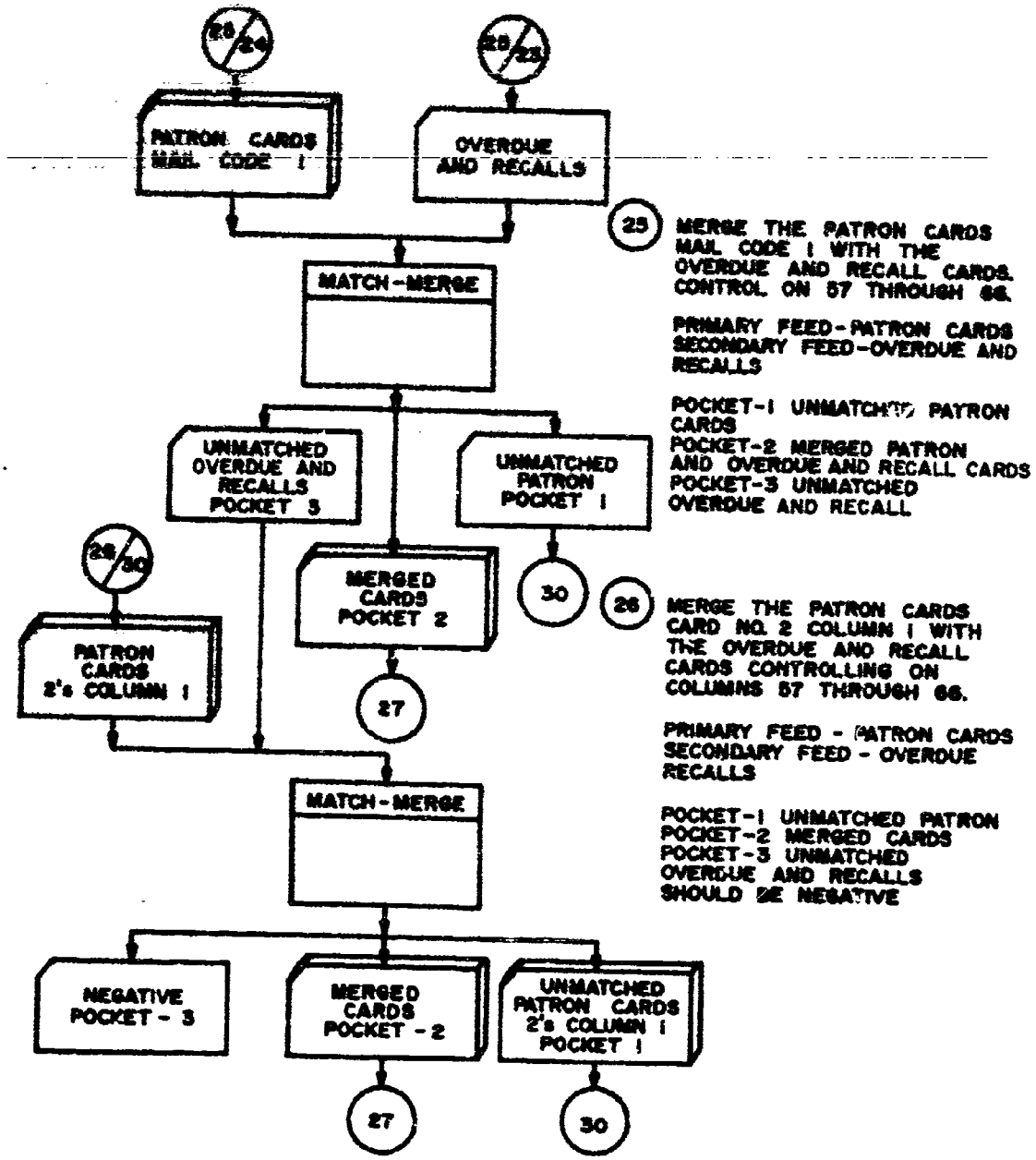


Figure 17. (Continued)

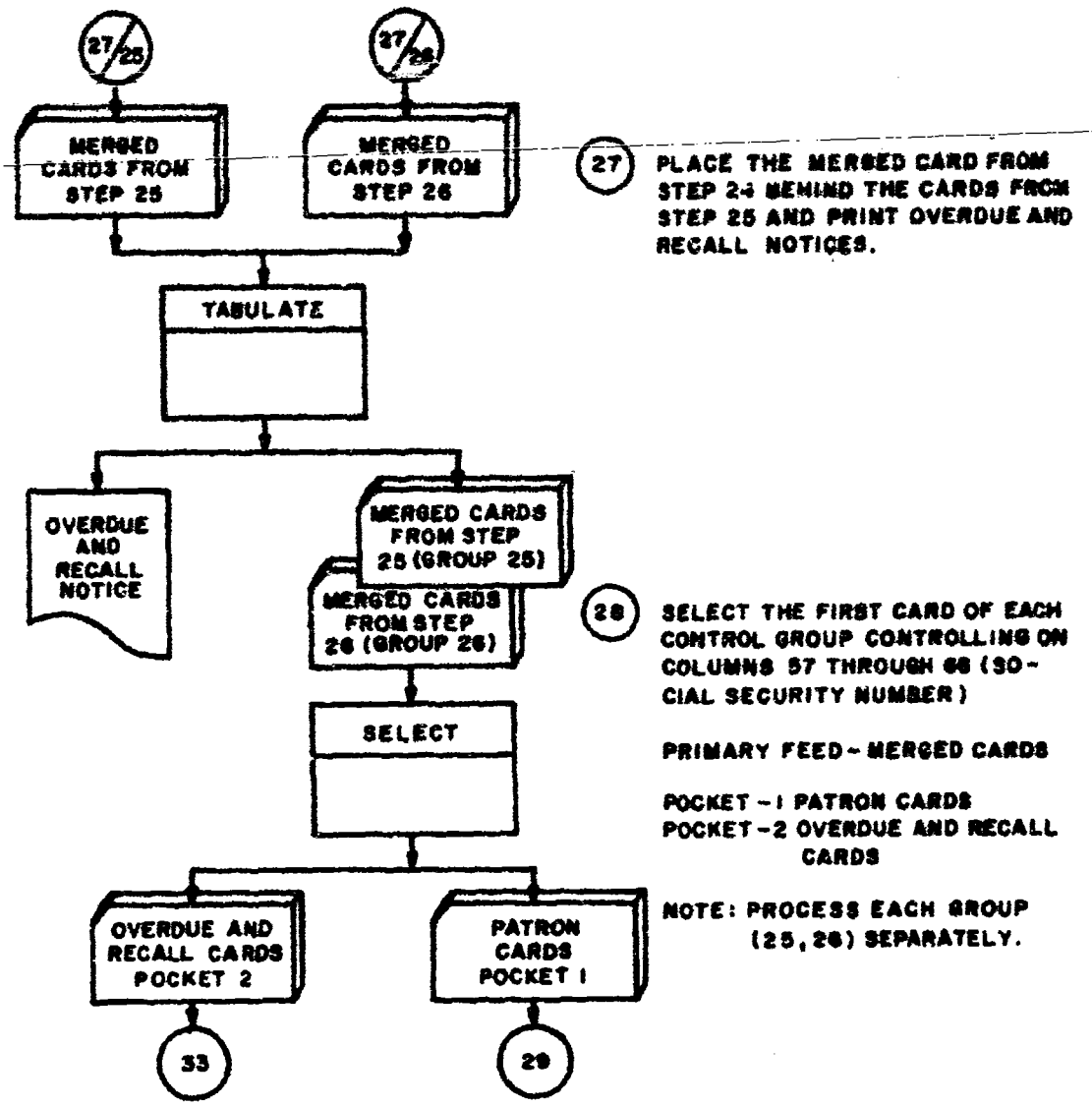
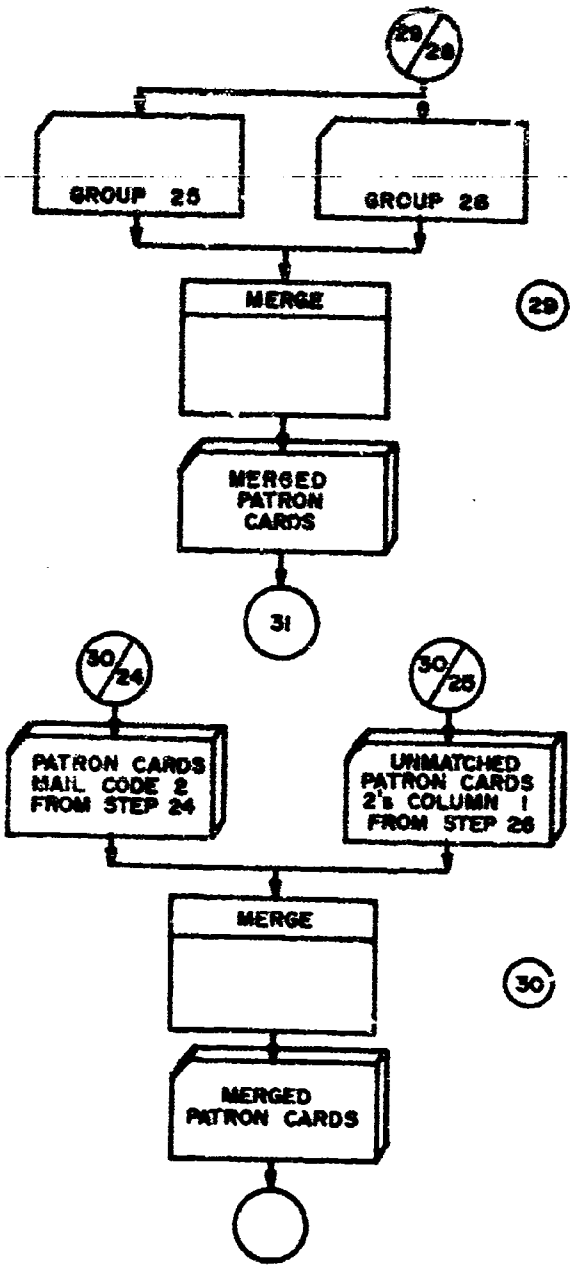


Figure 17. (Continued)



29 MERGE THE PATRON DATA CARDS FROM STEP 27 TOGETHER CONTROLLING ON COLUMNS 57 THROUGH 66 AND COLUMN 2.

30 MERGE THE PATRON DATA CARDS FROM STEPS 24 AND 26 TOGETHER CONTROLLING ON COLUMNS 57 THROUGH 66 AND COLUMN 2.

Figure 17. (Continued)

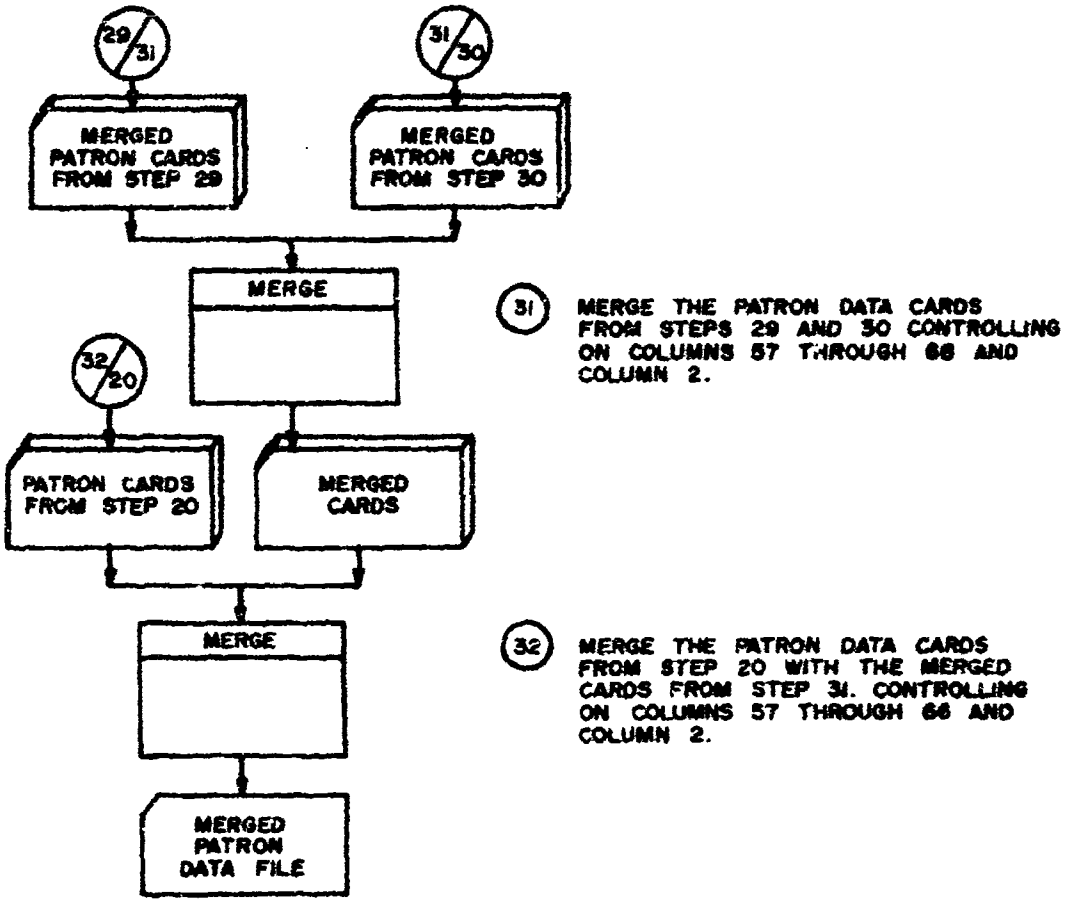
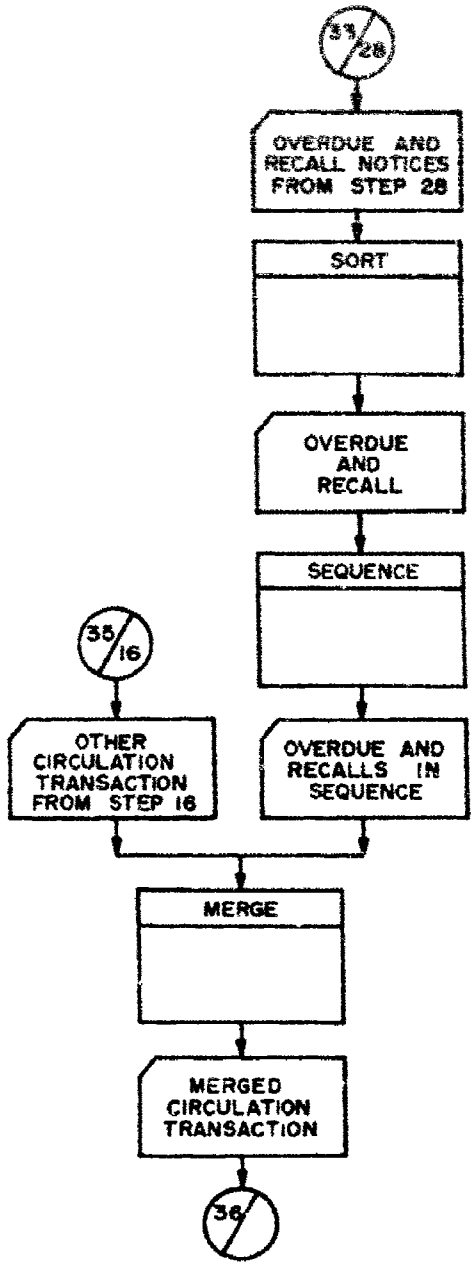


Figure 17. (Continued)

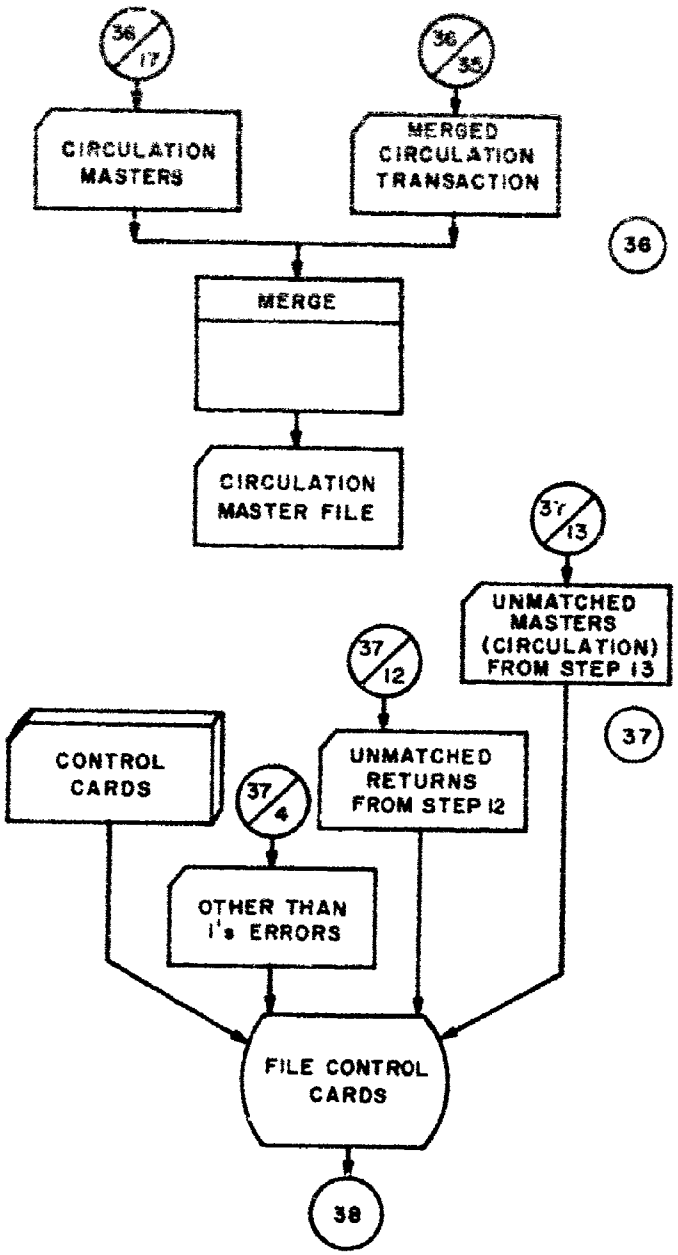


(33) SORT THE OVERDUE AND RECALL TRANSACTIONS ON 35 THROUGH 2 (CALL NO.).

(34) SEQUENCE CARDS ON COLUMNS 2 THROUGH 35.

(35) MERGE THE CIRCULATION TRANSACTION FROM STEP 16 WITH THE OVERDUE AND RECALLS FROM STEP 34, CONTROL ON COLUMNS 2 THROUGH 35.

Figure 17. (Continued)



(36) MERGE THE CIRCULATION MASTERS FROM STEP 17 AND CIRCULATION TRANSACTIONS FROM STEP 35. CONTROLLING ON COLUMNS 2 THROUGH 35. SEQUENCE CHECK CARDS AFTER MERGING.

(37) PLACE CONTROL CARDS IN FRONT OF EACH GROUP OF CARDS.

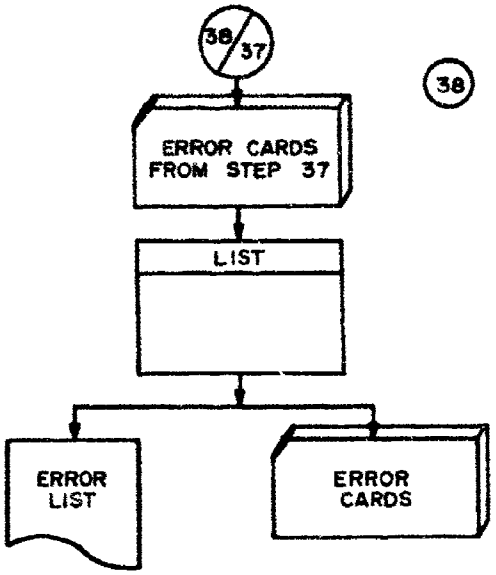
CONTROL CARDS A COLUMN 1
CIRCULATION MASTERS THAT DID NOT MATCH ON DATE PUNCHED IN TRANSACTION CARD.

CONTROL CARDS B COLUMN 1
UNMATCHED RETURNS THAT DID NOT MATCH ON DATE OF CIRCULATION FILE.

Figure 17. (Continued)

CONTROL CARDS C COLUMN 1
OTHER THAN CHECKOUT TRANSACTIONS
THAT DID NOT MATCH ON DATE
OR CALL NO. IN CIRCULATION MASTERS.

NOTE: CONTROL CARD DATA IS
PUNCHED 80-80 BEGINNING
IN COLUMN 3.



(38) LIST THE ERROR CARDS ON THE TABULATOR. THESE LISTS ARE USED IN CONJUNCTION WITH THE WEEKLY ACTIVITY LIST OF CIRCULATION MASTERS FROM STEP 11, WHICH IS A LIST OF ALL CIRCULATION MASTERS THAT HAD ACTIONS PROCESSED AGAINST IT FOR THE WEEKLY PERIOD.

Figure 17. (Concluded)

CIRCULATION CARD PRINT FORMAT

DESCRIPTION	CARD COLUMNS	PRINT POSITIONS
ACTION CODE	1	3
CALL NO. /AUTHOR TITLE	2 - 50	6 - 54
SECURITY CODE	51	56
TYPE LOAN	52	60
LOAN DATE	53 - 56	64 - 67
SOCIAL SECURITY NO.	57 - 66	69 - 78
SURNAME	67 - 78	80 - 91
INITIALS	79 - 80	93 - 94

COLUMN HEADINGS FOR LIST HAVE BEEN PROVIDED FOR IN PRINT SPACING. Headings for column identification are not shown.

Figure 18. Circulation Card Print Format

TO: PATRON NAME AND INITIALS
STREET/OFFICE SYMBOL
CITY/BUILDING

SOCIAL SECURITY NO.
PHONE

DA MON YR
XXX XXXX

RECALL OR OVERDUE NOTICE

FROM: LIBRARY
xxxxxxxx xxxxxx
xxxxxxxx xxxxxx

THE BOOKS LISTED BELOW ARE NEEDED FOR LOAN TO ANOTHER PATRON, FOR REPROCESSING, OR ARE OVERDUE. PLEASE RETURN THEM TO THE ABOVE ADDRESS IN PERSON OR BY MAIL ALONG WITH THIS NOTICE. IF THE TYPE LOAN IS 2, INDICATE IF YOU DESIRE RETURN OF BOOK AFTER REPROCESSING.

TYPE LOAN	CALL NO. /AUTHOR TITLE	DATE OF LOAN

Figure 19. Request for Recall or Overdue Notice

Section IV. SMALL SCALE CONTROL SYSTEM

1. Small Scale Circulation System

a. Introduction and Use

The following documentation represents a library circulation system utilizing a small scale computer with a minimum of four tape units, one printer, and a card reader and punch. The system is so designed to allow the user to perform the following:

1) Input data with no requirement for keypunch verification.
2) Use actual call numbers (LC and Dewey) as major controls.
3) Use a single card input containing all the prerequisite information for charging and discharging books.
4) Produce circulation listings in the conventional LC sequence.

Input to the system (Figure 20) is the same format as the basic manual library system. The patron master file used in Run 8 (Figure 21) is fully described below in Paragraph 2. Its use in this system is limited to extracting patron mailing addresses for overdue notices and recall notices.

The system provides the lending agency with the following work lists and management reports:

(1) Edit Error Lists. Each transaction is edited for complete and missing data prior to processing against the circulation master file. Any data element not meeting the edit criteria results in the transaction's being rejected, with a message indicating the cause of the rejection. In addition to the initial transaction edit, additional edits are performed in the circulation update run which results in rejection of the transaction with error messages indicating the cause of rejection.

(2) Circulation Master List in Call Number Sequence (Figure 22). This listing indicates the status of each book on loan. The listing provides the following information:

1) Call number.
2) Author and title.

3) Type item.
4) Classification.
5) Type of loan.
6) Date of loan.
7) Patron social security number.
8) Patron name.

The primary functions of this list are to determine if the book is on loan, is lost, or has been flagged for recall; the number of overdue notices prepared; the availability of the book for loan to another patron; and it is used as a source document to prepare transactions for recall of books.

(3) Circulation Master in Patron Name Sequence (Figure 23). This listing provides an inventory of books on loan to each patron. The data displayed is the same as the list in call number sequence. The primary function of this list is to insure that the patron has no books on loan when clearing or to make proper disposition action on books for patrons who have cleared and to whom books are still charged.

(4) Recall Notice (Figure 24). This notice is produced by the computer as a result of preparation of a recall notice transaction as shown in Figure 25. Individual copies or all copies can be recalled. If all copies are to be recalled, the copy number field of the transaction is left blank. The primary function of this list is to recall books for loan to anotner patron. Figure 24 shows the format of this report.

(5) Overdue Notice (Figure 26). This notice is produced automatically by the computer by analyzing the type loan, date of loan, and current date. This segment of the program insures that each loan of books is monitored and that an overdue notice is prepared 30 days after the book loan becomes delinquent. A total of three overdue notices is prepared, the first notice in 30 days (as noted above), the second in 60 days, and the third in 90 days, after which time a transaction is prepared and the circulation master is flagged as lost.

The logic of the system (Figure 27) may be better explained as follows:

1) Run 1 sorts input to LC sequence (call number).
2) Run 2 edits transactions and formats to circulation master file.
3) Run 3 updates circulation master, extracts recalls and overdues, and produces an error list.

4) Run 4 sorts circulation master to name sequence.
5) Run 5 formats circulation master in name sequence and prints circulation list.
6) Run 6 formats circulation master in LC sequence and prints circulation list in LC sequence.
7) Run 7 sorts overdue and recall items to social security sequence.
8) Run 8 extracts mailing information from a patron file in social security number sequence and prints the overdue and recall items and 5-by-8 forms (Figures 24 and 26).

b. General Processing Procedures

Each circulating book in the system carries a pocketed, prepunched EAM card containing the action code (1), the call number, the last name of the first author, the abbreviated book title, and the security classification (Figure 20). This information, called article identification, is prepunched in columns 1 through 51 and printed along the top edge of the card. The system provides a unique flexibility in that all 50 columns may be used without the conventional restriction of fixed field limits; a special character (asterisk) is used to denote field separation between the call number and the author and title.

When a book is brought to the circulation desk for loan, the EAM card is pulled from the book and the loan information (type of loan (1, 8, or 9), date of loan, and name and social security number of the patron) is keypunched and printed (Figure 20) in columns 52 through 80. After the loan information is recorded, the completed master card is duplicated, one copy is returned to the pocket inside the book, and the book is released to the patron. The duplicate card is forwarded to the computer, where it is later reflected on the circulation listings.

When a book is returned to the circulation desk either by mail or personal delivery, the duplicate card is removed from the book pocket and inserted in the keypunch, and the article identification portion (columns 2 through 51) is reproduced on a new card. This new card is placed in the book, which is then returned to the shelf. Because it is unnecessary to punch manually the article identification each time, the possibility of human error is reduced. The master card removed from the book is coded with an overpunch (an eleven punch) in column 1 (Figure 20) to indicate to the circulation listing and is sent to the computation center along with the other cards representing the loaned and returned items.

To recall books that are on loan, a transaction card (Figure 25) will be prepared containing the action code 2 in column 1 and the call number in columns 2 through 37. This transaction will recall a specific book. If the copy number is omitted, a recall notice will be generated for all books of that call number that are on loan. Include the asterisk following the call number. To flag a book as lost, prepare a transaction card (Figure 28) containing the action code 0 (zero) in column 1 and the call number in columns 2 through 37; include the asterisk. This transaction will cause the computer to change the action code in the circulation master.

To flag a book as found, prepare a transaction card (Figure 28) containing the action code 0 (ALPHA 0) in column 1 and the call number in columns 2 through 37; include the asterisk. This transaction will cause the computer to change the action code in the circulation master.

c. Card Formats and Punching Instructions

(1) Preparation of the Circulation Card. The operator will remove the circulation card (Figure 20) and complete the punching of the loan information tabulated below. The card will be reproduced; the original will be placed in the pocket of the book and the reproduced card will be placed in the box marked "circulation transaction."

Columns	Information	Code Meaning
51	Security classification	0 - Unclassified U - Unclassified 1 - Confidential C - Confidential 2 - Secret S - Secret 3 - Top secret T - Top secret
52	Type of loan	1 - Regular (180-day loan) 8 - Interlibrary 9 - Extended (1-year loan)
53	Current year	
54-56	Today's date, Julian form 182 (182nd day of the year)	
57-65	Patron social security number 111223333	

Columns	Information	Code Meaning
66-78	Patron last name (Do not leave a space in the surname, e.g., McKay would be punched MCKAY)	
79-80	Patron initials	

If it is necessary to punch the entire circulation card for any reason, the procedure tabulated below should be used for the article identification (columns 1 through 50):

Columns	Information	Code Meaning
1	Action code	1 Check out J Return 0 Lost $\bar{0}$ Found 2 Recall of loan
2-50	Call number, author and title Punch the call number followed by an asterisk and use the balance of the columns (through 50) for the author and title information.	

As can be seen from Figure 29, the LC number is divided into six major fields followed immediately by an asterisk. The library designations for these fields and divisions are shown underneath the figure.

(a) Field 1 of Figure 29 — This field, which is always alphabetic, may be composed of one or two alphabetic characters and must always be followed by a blank.

(b) Field 2 of Figure 29 — This field must always be all numeric and must not exceed four characters. If there is no Field 3, Field 2 is followed by a blank.

(c) Field 3 of Figure 29 — This field, if it exists in the LC number, is always separated from Field 2 by a decimal point (period) and cannot exceed seven characters.

(d) Field 4 of Figure 29 – This field must always begin with an alphabetic character followed by no more than three numbers. Field 4 is always followed by a blank.

(e) Field 5 of Figure 29 – This field must contain four numeric numbers (date) or four numeric numbers followed by a dash (–) and two numeric numbers or in the case of no date, ND.

(f) Field 6 of Figure 29 – This field represents the balance of the LC number and is contained until completion of the LC number. The last alphabetic character in the string must be a C or X. If X is the last character (denoting the book as an expendable item), it must be preceded by a C (denoting the copy number of the book). The last numeric characters in the string following the C must not be greater than 300. The last character of the string is always followed by an asterisk.

(2) Instructions for Punching a Dewey Call Number

(a) Field 1 – Punch the call number beginning in column 2. This field must contain at least three numeric characters. If the call number contains a period, the character following the period must be numeric.

(b) Field 2 – Space.

(c) Field 3 – First initial of the author's surname.

(d) Field 4 – Space.

(e) Field 5 – Accession number of copy number (C2) followed by an asterisk.

(3) Date – Field 4. A constant of ND, or a maximum of four numeric characters followed by a dash, followed by two numeric characters.

Date Examples

ND
NNNN
NNNN–NN

(4) Volume/Serial Copy — Field 5. This field may contain a maximum of 27 characters. An asterisk will signify the end of the field. The copy number immediately preceding the asterisk must be of the following form.

Copy Number Examples

AN	ANX
ANN	ANNX
ANNN	ANNNX

A is a constant C and X designates an expendable item. The numeric value of the copy number may not be greater than 300.

The only exception to the copy number rule is found in transactions recalling all books falling within a given call number. If no copy number is present, the action code in column 1 of the transaction must be 2.

(5) Dewey Call Number Edit Checks. The following edit checks are made on all Dewey numbers:

1) First three characters must be numeric (NNN. N).
2) Four and five characters may be . N or bA (NNN A).

(6) Discharge of Circulated Books. To accomplish the discharge of charged books, the operator will remove the card from the book and complete the following:

1) Overpunch (11 punch) in column 1.
2) Reproduce a new card with a 1 in column 1. Duplicate through column 51.
3) Place overpunched card in transaction box.
4) Place reproduced card in book pocket and put books on the shelving cart. To recall books on loan, prepare the transactions (Figure 25) as tabulated below:

Columns	Information	Code Meaning
1	Action code 2	Recall
2-37	Call number (To recall a book needed for loan to another patron, punch the call number minus the copy number (include asterisk)).	

(7) To Flag a Copy of an Item as Lost (Figure 28). If a copy of an item (book or periodical) has been reported lost, flag the circulated copy as tabulated below:

Columns	Information	Code Meaning
1	Action code 0 (zero)	Lost
2-37	Call number and asterisk	

(8) To Flag a Copy of an Item as Found (Figure 28). If a lost copy of an item has been found and the patron is still charged with the loss, prepare a transaction to remove the lost flag as tabulated below:

Columns	Information	Code Meaning
1	Action code Ō (ALPHA 0)	Found
2-37	Call number and asterisk	

(9) Circulation Edit Error Listing. As each transaction is edited, the following messages are applied to the transaction not meeting the edit criteria. These must be corrected and resubmitted. Listed below in card data field order are the various error messages, their meanings, and suggested corrective actions.

LC CALL NUMBER ERRORS

Message	Meaning	Action
INVALID TRANSACTION CODE	Card column 1 does not contain a valid checkout, return, lost, found, or recall.	Determine correct transaction code. Punch and resubmit for processing.
MAIN CLASS INVALID	First alpha character in the LC number is an I, O, W, X, or Y.	Determine correct LC. Punch and resubmit the transaction.
MAIN CLASS TOO LONG	Card column 3 or 4 does not contain a blank.	Determine correct LC. Punch and resubmit the transaction.

Message	Meaning	Action
MAIN CLASS CONTAINS A NUMERIC CHARACTER.	Card column 2 and 3 contains a numeric character.	Determine correct LC. Punch and resubmit the transaction.
SUBDIVISION TOO SHORT	Card column following first blank after card column 2 not numeric.	Determine correct LC. Punch and resubmit the transaction.
SUBDIVISION TOO LONG	Blank or period not present to separate subdivision from cutter.	Determine correct LC. Punch and resubmit the transaction.
SUBDIVISION CONTAINS ALPHA CHARACTERS	ALPHA characters are present in the subdivision field. (Subdivision is between the first and second blank and/or period.)	Determine correct LC. Punch and resubmit the transaction.
FURTHER SUBDIVISION IS TOO SHORT	There are no numeric characters after the period.	Determine correct LC. Punch and resubmit the transaction.
FURTHER SUBDIVISION IS TOO LONG	More than seven characters follow the period without a blank to separate the field.	Determine correct LC. Punch and resubmit the transaction.
CUTTER NUMBER STARTS WITH A NUMERIC CHARACTER	Self-explanatory.	Determine correct LC. Punch and resubmit the transaction.
CUTTER NUMBER CONTAINS AN ALPHA CHARACTER AFTER THE FIRST CUTTER POSITION	Self-explanatory.	Determine correct LC. Punch and resubmit the transaction.
CUTTER NUMBER IS TOO SHORT	Second character in the cutter number is not numeric.	Determine correct LC. Punch and resubmit the transaction.

Message	Meaning	Action
CUTTER NUMBER IS TOO LONG	Cutter number is not separated from the date field by a blank.	Determine correct LC. Punch and resubmit the transaction.
DATE FIELD HAS ALPHA OTHER THAN "ND"	Self-explanatory.	Determine correct LC. Punch and resubmit the transaction.
DATE FIELD CONTAINS A BLANK	Self-explanatory.	Determine correct LC. Punch and resubmit the transaction.
DATE NOT IN RANGE 1790 - PRESENT	Self-explanatory.	Determine correct LC. Punch and resubmit the transaction.
COPY NUMBER FIELD NOT PRESENT	Call number does not contain a copy number.	Determine correct LC. Punch and resubmit the transaction.
COPY NUMBER IS BLANK	Character following the last C is blank.	Determine correct LC. Punch and resubmit the transaction.
ALPHA CHARACTERS IN FIRST THREE POSITIONS OF DEWEY NUMBER	Self-explanatory.	Determine correct Dewey number. Punch and resubmit the transaction.
BLANK CHARACTERS IN FIRST THREE POSITIONS OF DEWEY	Self-explanatory.	Determine correct Dewey number. Punch and resubmit the transaction.
INVALID SECURITY CLASSIFICATION	Column 51 must be 0, 1, 2, 3 or U, C, S, T	Determine correct code. Punch and resubmit the transaction.
INVALID TYPE LOAN CODE	Column 52 does not contain a 1, 8, 9	Determine correct code. Punch and resubmit the transaction.
INVALID DATE	Column 53-56 Julian date cannot be decoded.	Determine correct date. Punch and resubmit the transaction.

Message	Meaning	Action
DATE TOO HIGH	Column 53-56 loan date is too high.	Determine correct date. Punch and resubmit the transaction.
INVALID S. S. NR.	Column 57-65 social security number not all numeric.	Correct, repunch, and resubmit.
MISSING OR INVALID SURNAME	Column 66-78 is all blanks, has numeric character or interspersed blanks.	Correct, repunch, and resubmit.
MISSING OR INVALID INITIALS	Column 79-80 is all blanks, numeric, or special characters.	Correct, repunch, and resubmit.

CIRCULATION UPDATE ERROR INDEX

Error Code	Message	Meaning	Action
1	Trying to loan a book already on loan.	Book being loaned could be: 1) A duplicate. 2) Return transaction never processed. 3) Copy number erroneously punched. 4) Call number erroneously punched.	If this is a duplicate transaction, no further action is required. If duplicate lettering of a copy number, see supervisor for corrective action. If copy number or call number was punched erroneously, punch a new transaction and resubmit.
2	Trying to loan a book recorded as lost.	Same as above.	Same as above, except punch two transactions, a J, and 1.

Error Code	Message	Meaning	Action
3	Renewal of book not on loan.	Self-explanatory.	Check call number to see if it was punched correctly. If correct, check the transaction listing to see if a "return" was also processed before the recall action. If so, no action is required. If call number was correct, and no return has been processed, check for bug in program. If LC was wrong, punch a new transaction and resubmit.
4	Recall of book recorded as lost.	Self-explanatory.	Same as above, except a "lost" action rather than a return may have preceded the recall action.

(10) LC Call Number Edit Criteria. The LC call number should be edited as follows:

Legend:
- A - ALPHA character.
- N - Numeric character.
- C - ALPHA or numeric character.
- b - Blank column separator.
- ND - No date constant.

An asterisk will be the terminal character of any call number. The call number must not exceed 36 characters excluding the asterisk.

(a) Main Class and Division - Field 1 — In this field there will be a minimum of one ALPHA character followed by a blank and a maximum of two ALPHA characters followed by a blank.

(b) Subdivision and Further Subdivision - Field 2 — In this field there will be a minimum of one numeric character followed by a blank and a maximum of 12 numeric characters followed by a blank.

Subdivision Examples

Nb
NNb
NNNb
NNNNb

Subdivision Examples with Further Subdivision Examples

N.	followed by	Cb
NN.	any	CCb
NNN.	combination	CCCb
NNNN.	of	CCCCb
		CCCCCb
		CCCCCCb
		CCCCCCCb

If further subdivision is present, the subdivision must be followed by a period instead of a blank.

(c) Cutter Number - Field 3 — In this field there will be a minimum of one ALPHA character followed by one numeric character and a blank and a maximum of one ALPHA character followed by three numeric characters and a blank.

Cutter Number Examples

ANb
ANNb
ANNNb

2. Small Scale Patron Control System

a. Introduction and Use

The following represents a mechanized system for maintaining a file of patron data to be used in a small computer library system utilizing a minimum of four tape units, one printer, and a card reader and punch.

The primary purpose for the patron file is to maintain a file of library users, validate social security numbers in input transactions, extract mailing addresses for overdue notices and recall notices, and prepare a historical record on patrons deleted from the system. The patron file is used in conjunction with updating the small scale computer library system.

Patron records that have a delete transaction processed are flagged as deleted and are not dropped from the system for a period of 30 days. This is provided for in the system in order that change transactions can be processed for reinstating a patron for organizational changes and other miscellaneous changes without preparation of a complete add-a-patron transaction.

Inputs for maintaining the system are generated by punching the required data from the Form 10, patron request card, which is described in Section II, in card form and performing the following maintenance functions (Figures 25 and 28):

1) Add a new patron.
2) Change existing patron data.
3) Flag a patron as deleted.

Book circulation transactions are also processed through the edit program of the patron master file for validation of social security number, name, initials, action code, and security code. This is accomplished by matching against the patron file on social security number, surname, and initials. If the transaction does not match the patron file, the transaction will be matched against the preceding patron transaction. If it is unmatched for both conditions, the circulation transaction will be flagged as an error. If the circulation transaction does not match the patron file but does match the patron transaction and the patron transaction is flagged with an error message, the circulation card will also be flagged as unprocessed.

Outputs from the system are as follows:

1) Valid circulation transactions (Figure 30).
2) Updated patron master (Figure 31).
3) Deleted patron record (Figure 32).
4) List of patrons by social security number sequence (Figure 33).
5) List of patrons by name sequence (Figure 34).
6) Transaction monitor with error messages for unprocessed transaction (Figure 35).

b. Processing Procedures

(1) Input Transactions. Input transactions are tabulated below:

Code	Description
A	Add a patron
C	Change a patron
D	Flag a patron deleted
All	Book circulation transactions

(2) Input Sequence. The input sequence is tabulated below:

Major	Social security number
Intermediate	Surname
Minor 1	Initials
Minor 2	Date of transaction
Minor 3	Action code
Minor 4	Card code

(3) Add a Patron - Transaction Code A. To add a patron to the file requires one or two cards to be prepared from the Form 10, patron request card. If the patron's street address, city, state, and ZIP Code are not available, only one card will be required to establish the patron on file. The following tabulated data are common to both the number 1 card and the number 2 card for action code A.

Data	Card Columns	Edit
Action code A	1	Action code must be present in both cards. Action code A may have two cards. Card number 1 punched with a 1 in column 2 and card number 2 punched with a 2 in column 2.
Social security number	57-66	Must be numeric. The number 1 card must match the number 2 card on social security number.
Surname	67-78	Initial characters must be of the form XX or XbXX or XXbXX where X's are valid characters. Multiple blanks are not permitted. Characters must be alphabetic or dashes.

Data	Card Columns	Edit
Name suffix	50-52	May be blank if punched number 1 card must match number 2 card.
Initials	79-80	Must be ALPHA, column 80 may be blank. Card number 2 must match number 1 card.

The following tabulated data are common to the number 1 card only for action code A.

Data	Card Columns	Edit
Citizenship	3-4	Must be all numeric and match table.
Phone number	5-15	Must be all numeric or blank.
Number	5-11	
Extension	12-15	
Organization	16-33	Must be punched A/N for all cards. Contractor organization for C (type patrons card column 44) is punched in columns 16-42. This field may be partially punched for C type patrons.
Contractor	16-42	
Building number	34-38	Must be punched for M, A, or N type patrons.
Room number	39-42	Must be punched for M, A, or N type patrons.
Mail code	43	Must be punched 1 or 2.
Patron type	44	Must be coded C, M, A, N, or O.
Security code	45	Must be punched U, C, S, or T.
Title or grade	46-49	Must be punched A/N.

The following tabulated data are common to the number 2 card only for action code A.

Data	Card Columns	Edit
Street address	3-23	May be blank. If blank, then columns 16-42 of the number 1 card must be punched for contractor type personnel and mail code must be a 1. If punched, then columns 24-38, 39-43, and 44-48 must be punched.
City	24-38	See street edit.
State	39-43	See street edit.
ZIP code	44-48	See street edit.

(4) Change Patron Data - Transaction Code C. Patron data may be added, changed, or deleted by preparing either a 1 or 2 card or both, depending on the data to be changed. The data format is the same as for an add patron. The manipulation of the data depends on the presence or absence of data in the data field. An asterisk in the first position of a data field indicates the delete of that data in the master record. Adding or changing of data fields is accomplished by replacing the master file data with the transaction data. Blank transaction data fields indicate no change to the master record. Edits to the change transaction include social security number, surname, and initials; remaining edits will be restricted to those fields with data punched. Edits will be accomplished as described under the add-a-patron transaction.

(5) Delete Patron - Transaction Code D. This transaction will cause a patron to be flagged as a delete on the patron master file. Data required for preparation of this transaction will include action code D, card code 1, social security number, surname, and initials. Data edits will be accomplished in the same manner as for the number 1 card for these fields. When passing the patron master file, each record will be checked for the delete code D. If 30 days have elapsed since the record was flagged, a 5-by-8 card will be formatted as shown in Figure 32, and the record will be dropped from the system.

(6) Book Circulation Card Edits. The edits tabulated below will be performed on the book circulation cards.

Data	Card Columns	Edit
Action code	1	Must be punched with a 1, J, 0 (zero), $\bar{0}$ (zero) + 11.
Call number	2-50	This item is edited in the circulation run.
Security code	51	Must be punched 0 (zero), U, 1, C, 2, S, 3, or T.
Type loan	52	Must be punched 1, 2, 8, or 9.
Date	53-56	Must be numeric and of the Julian type, that is, year in column 53 and day in columns 54-56.
Social security number	57-66	Must equal patron file or match preceding patron transaction card.
Surname	67-78	Same as above.
Initials	79-80	Same as above.

(7) Edit Error Codes and Their Meanings. Tabulated below are the edit error codes, their meanings, and suggested corrective actions.

Error Code	Meaning	Action
ER01	Invalid social security number	Correct social security number and resubmit for processing.
ER02	Invalid action code	Correct action code and resubmit for processing.
ER03	Invalid name	Correct and resubmit for processing.
ER04	Invalid suffix	Number 1 card does not match number 2 card. Correct and resubmit.

Error Code	Meaning	Action
ER05	Invalid initials	Numeric or does not match number 2 card. Correct and resubmit.
ER06	Invalid citizenship	ALPHA or missing. Correct and resubmit.
ER07	Invalid phone number	ALPHA or missing characters. Correct and resubmit.
ER08	Invalid organization or contractor	Missing data. Correct and resubmit for processing.
ER09	Invalid building number	Missing data. Correct and resubmit for processing.
ER10	Invalid room number	Missing data. Correct and resubmit for processing.
ER11	Invalid type	Patron type invalid. Correct and resubmit for processing.
ER12	Invalid security code	Missing or invalid security code. Correct and resubmit for processing.
ER13	Patron on file	Patron is already on file. Possible error in social security number.
ER14	Invalid change	Name or social security number in change card does not match name of social security number in patron file.
ER15	Invalid delete	Name in delete card does not match name in patron file for social security number. Correct and resubmit.
ER16	Invalid patron data	Data in patron transaction in error, circulation card not processed.
ER17	Invalid mail code	Mail code is blank or other than 1 or 2.
ER18	Invalid transaction	Number 2 card missing, or mail code in error.

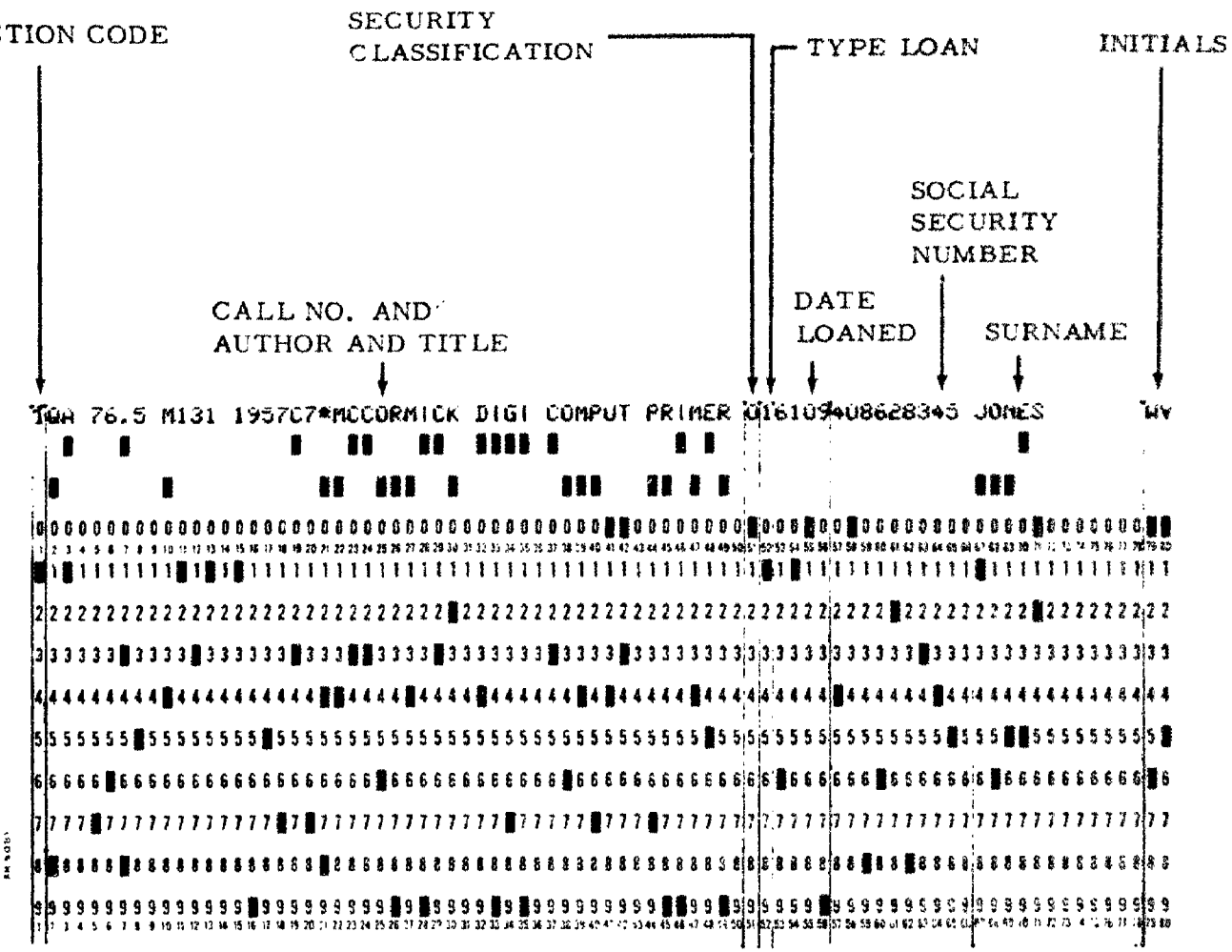


Figure 20. Small Scale Circulation System Input

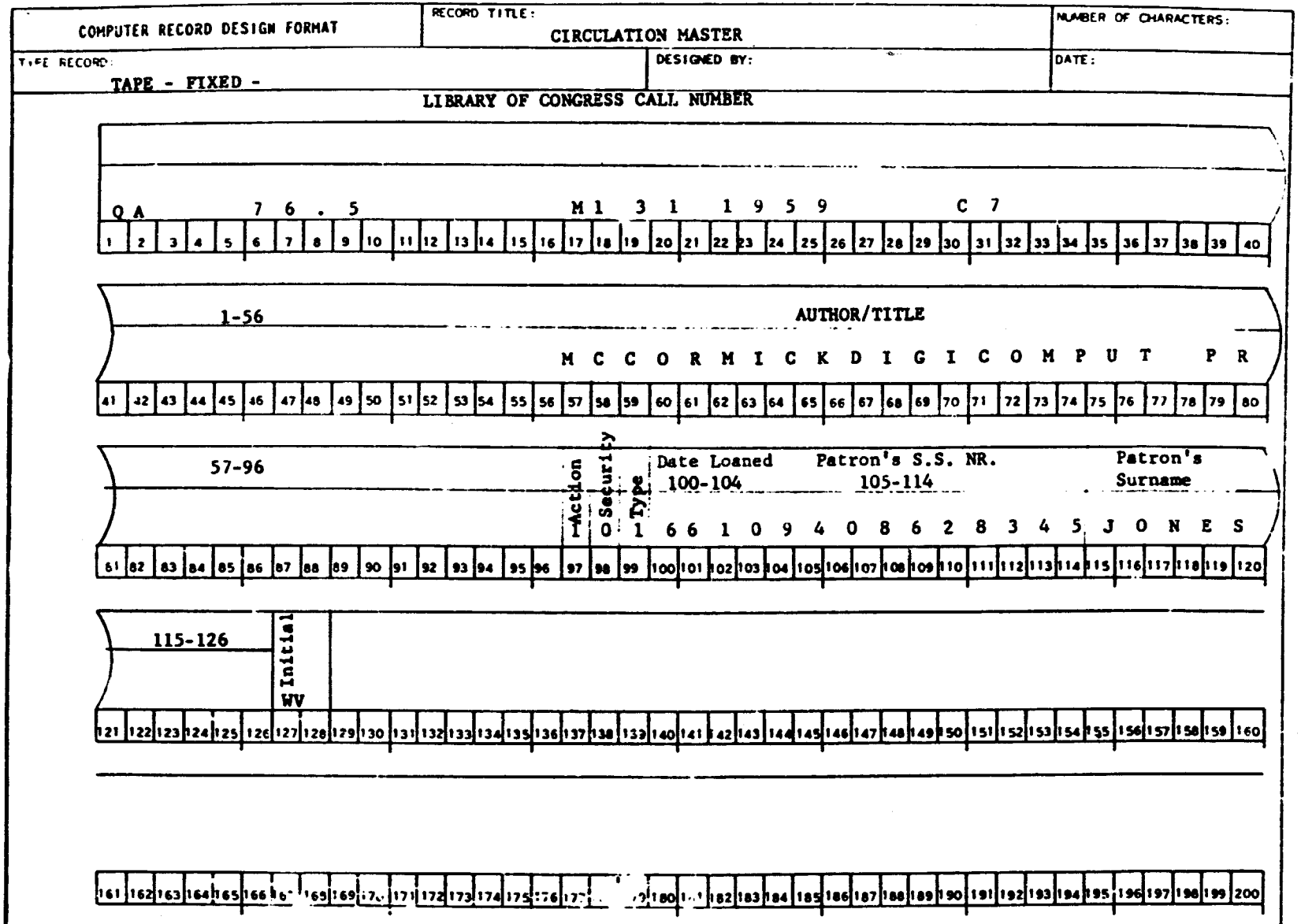


Figure 5

ANSI-S FORM 41, 1 APR 64 REPLACES DSA FORM 620 WHICH MAY BE USED

Figure 21. Patron Master File

[illegible] 27 OCT 63

		[illegible]		TITLE	[illegible]			[illegible]			[illegible]		
	[illegible]	[illegible]	[illegible]	[illegible]	1	0	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
	[illegible]	[illegible]	[illegible]	[illegible]	1	0	1	15	[illegible]	63	- -	[illegible]	
	[illegible]	[illegible]	[illegible]	[illegible] STROMBOSLE	1	0	1	7	[illegible]	63	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	1	0	1	[illegible]	[illegible]	63	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	1	0	8	9	OCT	63	- -	[illegible] OF ALA	
	[illegible]	C712	1961C4	[illegible] FLUIDS HYDRO PO	1	0	1	23	JUL	63	41[illegible]-22-7293	GAYLE	JB
	[illegible]	L664	1962C2	LEVICH PHYSICOCHEMICAL HYDROD	1	0	1	[illegible]	AUG	63	423-[illegible]	[illegible]	[illegible]
	[illegible]	L664	1962C3	LEVICH PHYSICOCHEMICAL HYDRODY	1	0	1	23	JUL	63	429-[illegible]	[illegible]	[illegible]
	[illegible]	L664	1962C4	LEVICH PHYSICOCHEMICAL HYDRODY	1	0	1	27	AUG	63	404-46-2722	EGGER	CT
	[illegible]	L664	1962C5	LEVICH PHYSICOCHEMICAL HYDRO	1	0	1	8	OCT	63	257-38-3839	CREWS	MC
	[illegible]	L664	1962C6	LEVICH PHYSICOCHEMICAL HYDRODYN	1	0	1	15	MAR	63	- -	WRIGHT	J
	[illegible]	S989	1959C6	SYMPOSIUM [illegible] HYDRODYNAMICS	1	0	1	10	MAY	63	416-62-3593	[illegible]	F
	[illegible]	T216	1961C2	TATARSKII WAVE PROPAGATION	1	0	8	25	JUL	63	- -	UNIV OF ALA	
	[illegible]	T216	1961C3	TATARSKII WAVE PROPAGATION TUR	1	0	1	27	SEP	63	321-32-2087	JERANEK	RG
	[illegible]	T216	1961C4	TATARSKII WAVE PROPAGATION TUR	1	0	1	5	AUG	63	245-54-7256	SUH	SK
	[illegible]	T216	1961C5	TATARSKII WAVE PROPAGATION TUR	1	0	1	23	AUG	63	408-34-2105	BAKER	[illegible]
	[illegible]	L461	1957C2	LECK PRES PLASMA VACUUM SYS	1	0	1	6	JUN	63	570-38-5040	GOLDMAN	RG
	[illegible]	D972	1962C10	DUSHMAN SCI FOUND VACUUM TEC	1	0	1	7	MAY	63	295-32-[illegible]	PATTON	EM
	[illegible]	D972	1962C11	DUSHMAN SCIENTIFIC FOUNDATION	1	0	1	1	AUG	63	198-26-6406	SHATAS	PA
	[illegible]	D972	1962C12	DUSHMAN SCIENT FOUND VACUUM T	1	0	1	5	SEP	63	- -	UNIV OF ALA	
	[illegible]	D972	1962C13	DUSHMAN SCI FOUND OF VAC TECH	1	0	8		JAN	62	484-46-2722	EGGER	CT
	[illegible]	D972	1962C3	DUSHMAN SCIENTIFIC FOUNDA	1	0	1	9	JAN	63	428-55-8855	STONE	RN
	[illegible]	D972	1962C4	DUSHMAN SCIENTIFIC FOUNDA VACU	1	0	1	9	JAN	63	428-76-5613	HYDE	EH
	[illegible]	D972	1962C5	DUSHMAN SCIENTIFIC FOUNDATIONS	1	0	1	14	FEB	63	417-24-5194	WILLIAMS	JE
	[illegible]	D972	1962C6	DUSHMAN SCIENTIFIC FOUNDA VACU	1	0	1		MAR	63	552-44-0922	CHENG	LM
	[illegible]	D972	1962C7	DUSHMAN SCIENTIFIC FOUNDA VACU	1	0	1	8	MAY	63	416-34-3573	FRARY	SS
	[illegible]	D972	1962C8	DUSHMAN SCIENTIFIC FOUNDA VACU	1	0	1	2	JUL	63	416-40-5552	JERNIGAN	J
	[illegible]	D972	1962C9	DUSHMAN SCIENT FOUND OF VACUUM	1	0	1		JAN	62	428-56-8883	STONE	RN
	[illegible]	G984	1949C2	GUTHRIE VACUUM EQUIPMENT TECH	1	0	1	1	JUL	63	416-48-0551	BAYLESS JR	E
	[illegible]	G984	1949C3	GUTHRIE VACUUM EQUIPMENT TECH	1	0	8	6	SEP	63	- -	UNIV OF ALA	
	[illegible]	I61	1960V1C2	INT CONGR VAC TECH ADV VAC SC	1	0	1	4	OCT	63	512-40-1557	ARNETT	GM
	[illegible]	I61	1960V2C2	INTL CONGRESS VACUUM TECH	1	0	8	6	SEP	63	- -	UNIV OF ALA	
	[illegible]	I61	1960V2C3	INT CON VAC TECH ADV VAC SC-	1	0	1	8	JAN	63	419-34-4427	BRITT	WF
	[illegible]	N277	1957C2	NATIONAL SYMPOSIUM VACUUM	1	0	1	3	JUL	63	426-68-9640	EVANS	PD
	[illegible]	N277	1960C2	NATL SYMP VACUUM TECH	1	0	1		FEB	63	- -	MONTELEONE	FJ
	[illegible]	N277	1961C2	NATIONAL SYMPOSIUM VACUUM TECH	1	0	1	3	JUL	63	367-38-0457	GIEROW	HB
	[illegible]	N277	1961C3	NATL SYMP VACUUM TECH	1	0	1	13	MAR	63	419-34-4427	BRITT	F
	[illegible]	N277	1962V1C2	NATIONAL SYMPOSIUM VACUUM TE	1	0	1	13	MAR	63	467-48-6461	DALINS	I
	[illegible]	N277	1962V1C3	NATIONAL SYMPOSIUM VACUUM TE	1	0	1	15	MAR	63	- -	KERR	E
	[illegible]	N277	1962V1C4	NATIONAL SYMPOSIUM VACUUM TE	1	0	1	12	MAR	63	253-50-5613	CROW	TG
	[illegible]	N277	1962V1C5	NATIONAL SYMPOSIUM VACUUM TE	1	0	1	3	JUL	63	367-38-0457	GIEROW	HB
	[illegible]	N277	1962V1C6	NATL SYMP VACUUM TECH	1	0	1	13	MAR	63	484-46-2722	EGGER	CT
	[illegible]	N277	1962V1C7	NATIONAL SYMPOSIUM VACUUM TE	1	0	1	11	JUN	63	419-42-6087	CARTER	TJ
	[illegible]	N277	1962V1C8	NAT SYMP VAC TECH	1	0	1	13	MAR	63	419-34-4427	BRITT	F
	[illegible]	N277	1962V2C2	NATIONAL SYMPOSIUM VACUUM TE	1	0	1	13	MAR	63	467-48-6461	DALINS	I
	[illegible]	N277	1962V2C3	NATIONAL SYMPOSIUM VACUUM TE	1	0	1	15	MAR	63	- -	KERR	E
	[illegible]	N277	1962V2C4	NATIONAL SYMPOSIUM VACUUM TE	1	0	1	12	MAR	63	253-50-5613	CROW	TG
	[illegible]	N277	1962V2C5	NATIONAL SYMPOSIUM VACUUM TE									

Figure 22. Circulation Master List in Call Number Sequence

Best Available Copy

RSIC CIRCULATION LIST IN NAME SEQUENCE 27 OCT 63

NAME		S.S.NO.	ARTICLE NUMBER	TITLE	C	O	D	E	S	LOANED
BLACK	RD	444-28-3533	621.34 I C.1	IRE PROCEED NATL SYMP ON REL + QUAL	1	0	1			JAN 62
BLACK	RW	193-07-7506	423 W 59091	WEBSTER THIRD NEW INTL DICT ENGL LANG	1	0	1			JAN 62
BLACKSTONE	J	417-24-6269	510 S 7701	SCHELKUNOFF APPLIED MATHE ENGR SCIENTI	1	0	1			JAN 62
BLACKSTONE	J	417-24-6269	517.1 G 6471	GRANVILLE ELEMENTS CALCULUS	1	0	1			JAN 62
BLACKSTONE	J	417-24-6269	517.5 T 3676	TOWNSEND FUNCTIONS COMPLEX VARIABLE	1	0	1			JAN 61
BLACKSTONE	J	417-24-6269	621.8 B 10623	BROWN PRINC OF SERVOMECHANISMS	1	0	1			JAN 59
BLACKSTONE	JH	417-24-6269	QB 351 M133 1963C4	MCCUSKEY INTRO CELESTIAL MECH	1	0	1		10	OCT 63
BLACKSTONE	JH	417-24-6269	510.7324 T 51025	TRUITT BASICS OF ANALOG COMPUTER	1	0	1			JAN 61
BLACKSTONE	JH	417-24-6269	531.01? P 51115	PFEIFFER LINEAR SYSTEMS ANALYSIS	1	0	1			JAN 61
BLACKSTONE	JH	417-24-6269	537.1 L 51023	LOUISELL COUPLED MODE PARAMETRIC EL	1	0	1			JAN 61
BLACKSTONE	JH	417-24-6269	620.78 A 41054	AHRENDT AUTOMATIC FEEDBACK CONTROL	1	0	1			JAN 62
BLACKSTONE	JH	417-24-6269	621.3192 G 33942	GARDNER TRANSIENTS IN LIN SYS ST	1	0	1			JAN 60
BLACKSTONE	JH	417-24-6269	621.8 O 26434	OLDENBURGER FREQUENCY RESPONSE	1	0	1			JAN 60
BLACKSTONE	JH	417-24-6269	621.8 T 41172	TRUXAL AUTO FEEDBACK CONT SYS SYNTH	1	0	1			JAN 62
BLACKSTONE	JH	417-24-6269	623.4519 C 55385	CHIN MISSILE CONFIGURATION DESIG	1	0	1			JAN 62
BLACKSTONE	JH	417-24-6269	623.4519 K C.2	KEMP WHAT MAKES GUIDED MISS TICK	1	0	1			JAN 60
BLACKSTONE	JH	417-24-6269	623.54 R 166	ROSSER MATHE THEO Y OF ROCKET FLIGHT	1	0	1			JAN 60
BLACKSTONE	JH	417-24-6269	629.1323 K 51548	KOLK MODERN FLIGHT DYNAMICS	1	0	1			JAN 61
BLACKSTONE	JH	417-24-6269	629.13251 D 49519	DRAPER INERTIAL GUIDANCE	1	0	1			JAN 61
BLACKWELL	KL	424-48-0778	531.34 G C1	GRAY A TREATISE ON GYROSTATICS ROTATI	1	0	1			JAN 62
BLACKWOOD	RL	409-24-5762	603 C 22822	CHAMBERS TECH DICT	1	0	1			JAN 60
BLADEWOOD	CH	436-40-1345	533.62 A 64609	AKADEMIIA NAUK SSSR PHYS GAS DYNAM	1	0	1		10	JAN 63
BLAISE	HT	089-14-3103	621.7 A 10412	ASTE TOOL ENGINEERS HANDBOOK	1	0	1			JAN 60
BLANKWOOD	CH	436-40-1345	QC 168 B811 1962C6	BRADLEY SHOCK WAVES CHEMISTRY	1	0	1		27	APR 63
BLANKWOOD	CH	436-40-1345	QC 611 L989 1962C3	LYNTON SUPERCONDUCTIVITY	1	0	1		24	MAY 63
BLANKWOOD	CH	436-40-1345	QC 762 P152 1962C3	PAKE PARAMAGNETIC RESONANCE	1	0	1		16	APR 63
BLANKWOOD	CH	436-40-1345	QC 365 M399 1962C3	MASON METEORITES	1	0	1		17	APR 63
BLANKWOOD	CH	436-40-1345	541.3453 D 55066	DAVIES INTERFACIAL PHENOMENA	1	0	1			JAN 62
BLANSETT	J	417-24-6269	510 S 9372	SOLOMONOFF HIGHER MATHE ENGINEERS PHY	1	0	1			JAN 62
BLANCHE	J	438-38-1466	533.01 C 36615	COMMITTEE VACUUM TECHNIQUES	1	0	1			JAN 60
BLANCHE	JF	438-38-1466	510.835 C 50710	CRC STAN MATHE TABLES	1	0	1			JAN 61
BLANCHE	JF	438-38-1466	621.02 M 50254	MACHINERYS HANDBOOK	1	0	1			JAN 61
BLAND	RA	430-38-2266	QA 76.5 A465 1963C2	ALT FLECT DIGITAL COMP	1	0	1		13	MAY 63
BLAND	RA	430-38-2266	QA 76.6 S273 1963C4	SAXON PROG AND COMP	1	0	1		13	MAY 63
BLAND	RA	430-38-2266	QA 300 K44 1963C2	KAISCHEW COURSE OF MATH ANALYSI	1	0	1		17	MAY 63
BLAND	RA	430-38-2266	QA 372 M372 1963C2	MARTIN ELE DIFF EQUATIONS	1	0	1		13	MAY 63
BLAND	RA	430-38-2266	QA 401 S683 1963C3	SOKOLNIKOFF MATH OF PHY + ENG	1	0	1		13	MAY 63
BLAND	RA	430-38-2266	629.6 U 32C1	ULPAX TECHNICAL AEROPLANES	1	0	1		13	MAY 63

Figure 23. Circulation Master in Patron Name Sequence

TO	PATRON NAME AND INITIALS	SOCIAL SECURITY NO.	DA MON YR
	STREET/OFFICE SYMBOL	PHONE	xxx xxxx
	CITY/BUILDING	DATE OF LOAN	DA MON YR

PATRON RECALL REQUEST

Fold .. .. .. Fold

FROM LIBRARY BRANCH, RSIC
BUILDING 4484, AMSMI-RBLS
REDSTONE ARSENAL, ALABAMA
PHONE 876-5195

THE BOOK LISTED BELOW IS NEEDED FOR LOAN TO ANOTHER PATRON. IF NO LONGER REQUIRED, PLEASE RETURN IT TO THE ABOVE ADDRESS IN PERSON OR BY MAIL ALONG WITH THIS NOTICE.

CALL NO....
AUTHOR/TITLE...

Figure 24. Recall Notice

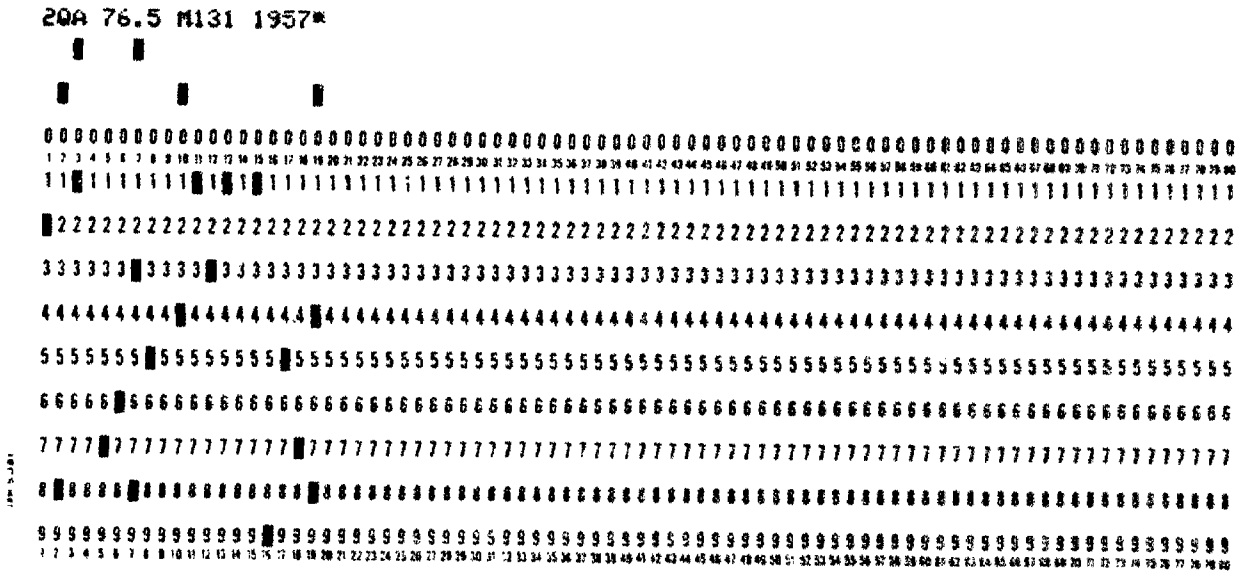


Figure 25. Recall Notice Transaction Card

TO	PATRON NAME AND INITIALS	SOCIAL SECURITY NO.	DA MON YR
	STREET/OFFICE SYMBOL	PHONE	xxx xxxx
	CITY/BUILDING	DATE OF LOAN	DA MON YR

OVERDUExxxNOTICE

Fold .. .. .. Fold

FROM LIBRARY BRANCH, RSIC
BUILDING 4484, AMSMI-RBLS
REDSTONE ARSENAL, ALABAMA
PHONE 876-5195

THE BOOK LISTED BELOW IS NOW OVERDUE. PLEASE RETURN IT TO THE LIBRARY. IF YOU ARE AN AMICOM OR MSFC EMPLOYEE AND NEED IT ON EXTENDED LOAN (MICOM R 705-7, MSFC R 25-8), PLEASE SO INDICATE AND THE BOOK WILL BE RETURNED TO YOU, IF POSSIBLE.

CALL NO....
AUTHOR/TITLE...

Figure 26. Overdue Notice

SYSTEM LOGIC

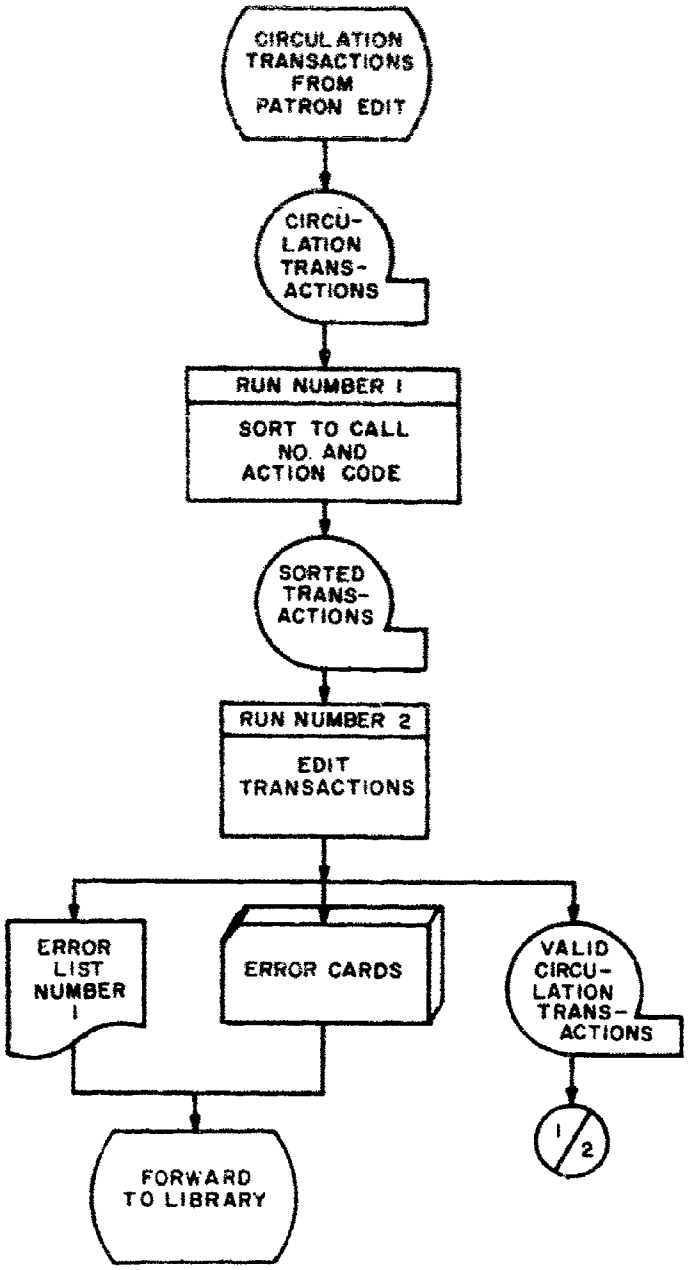


Figure 27. System Logic

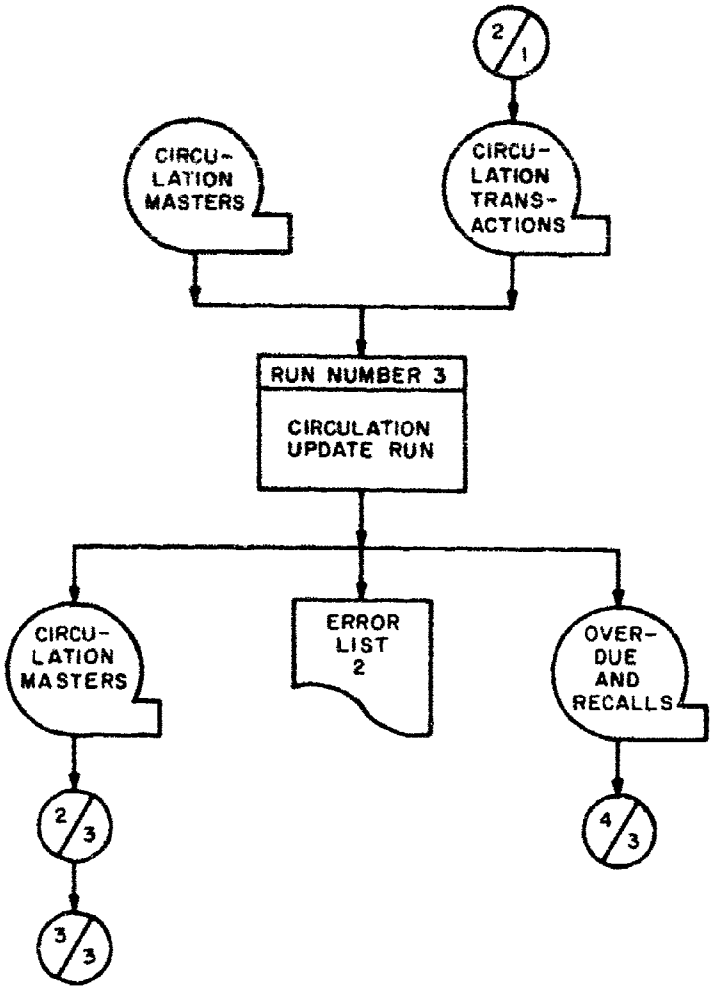


Figure 27. (Continued)

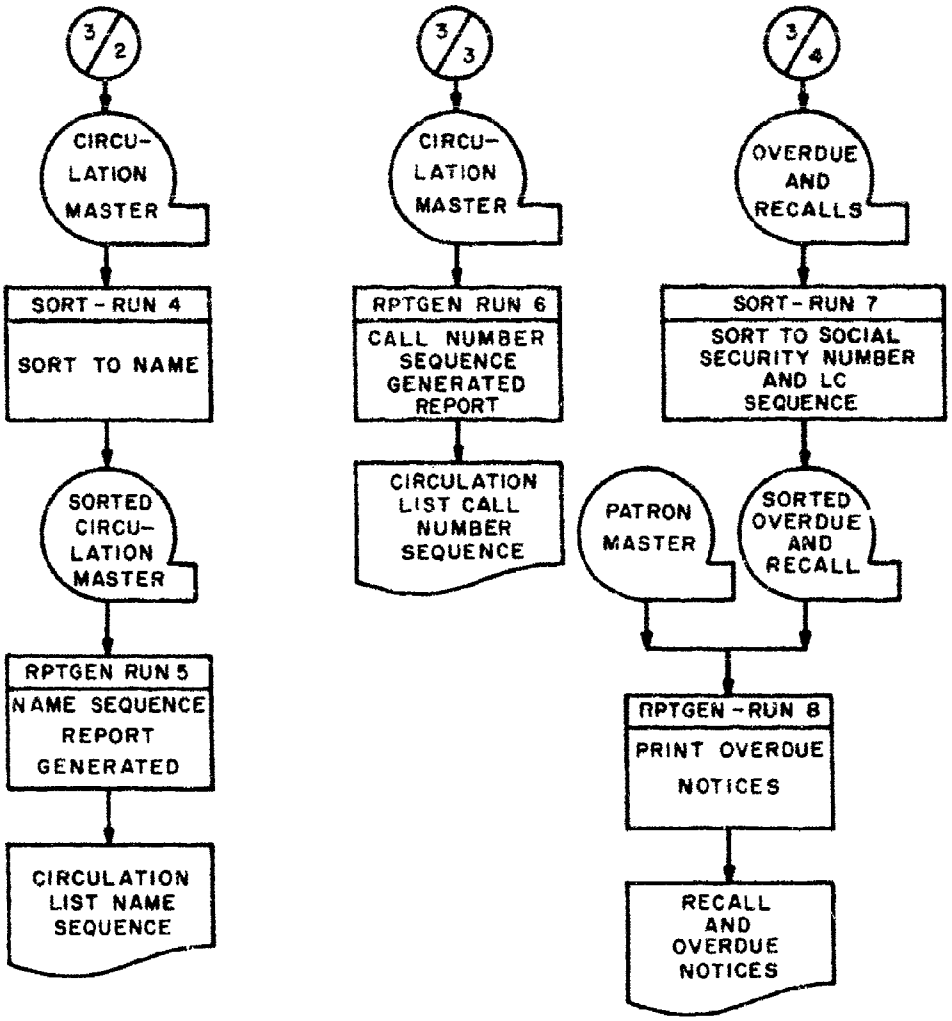


Figure 27. (Concluded)

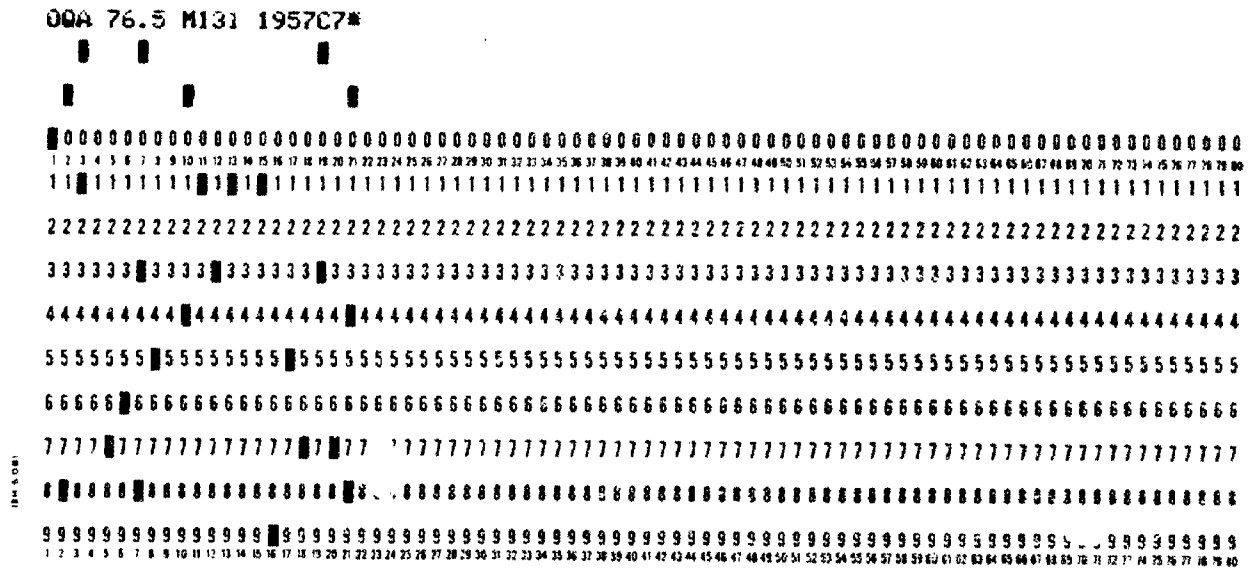


Figure 28. Transaction Card to Flag a Book as Lost or Found

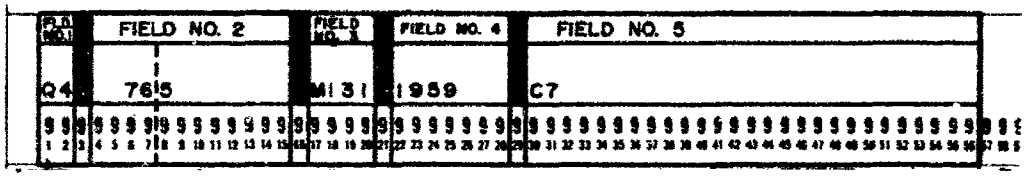


Figure 29. LC Number Divisions by Field

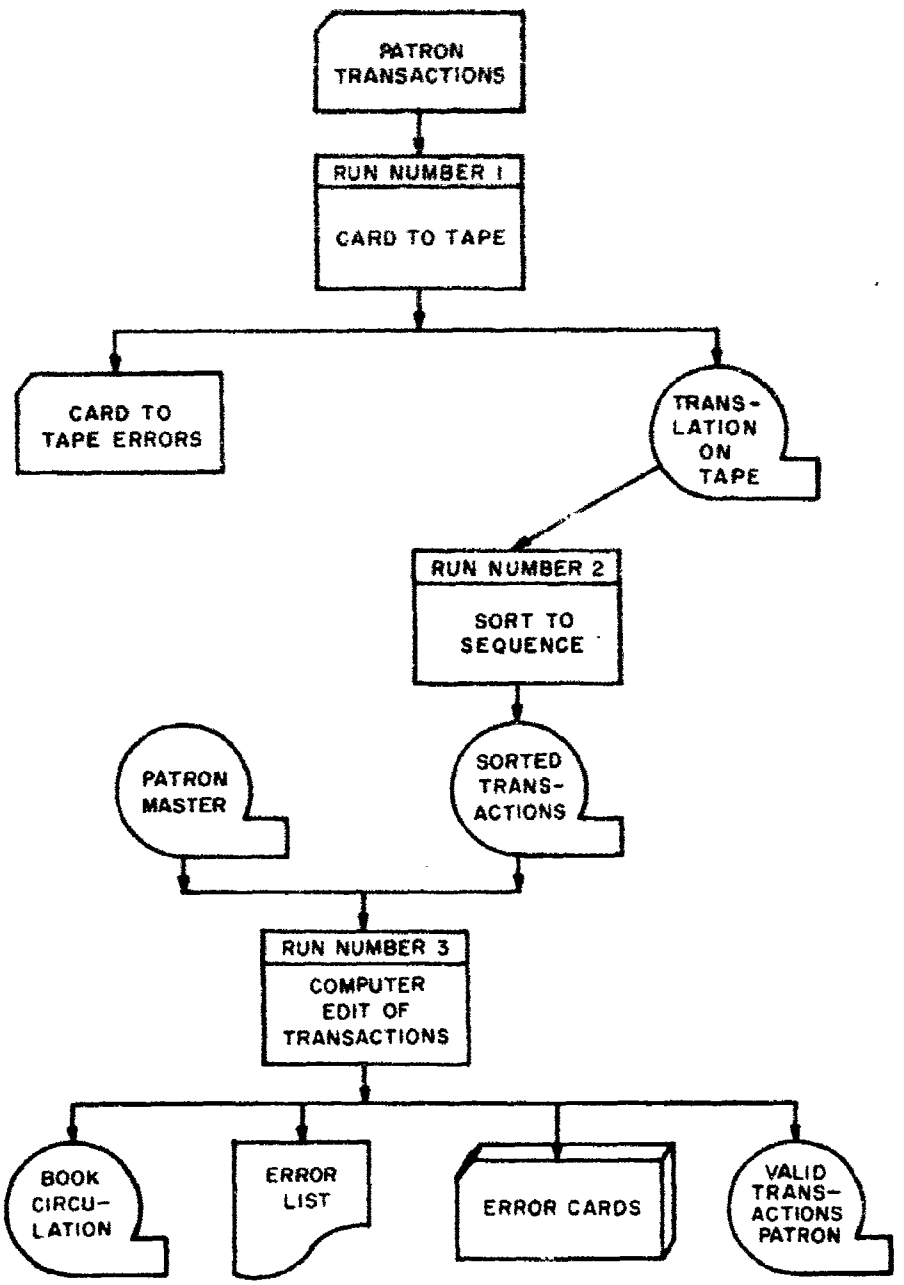


Figure 30. Valid Circulation Transaction

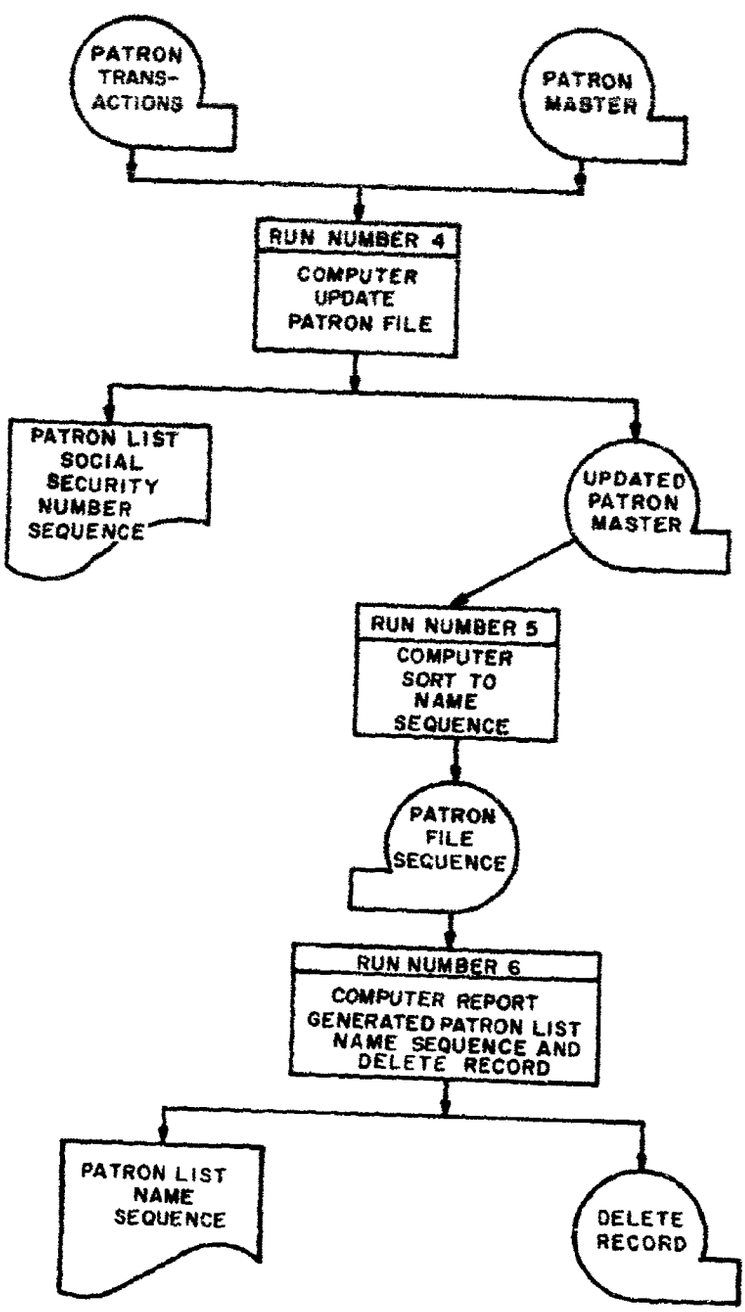


Figure 30. (Continued)

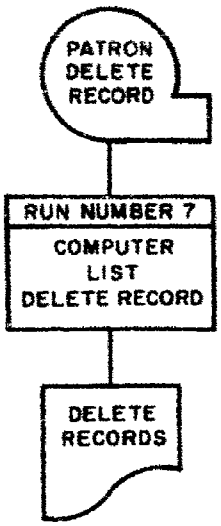


Figure 30. (Concluded)

PATRON FILE MASTER RECORD

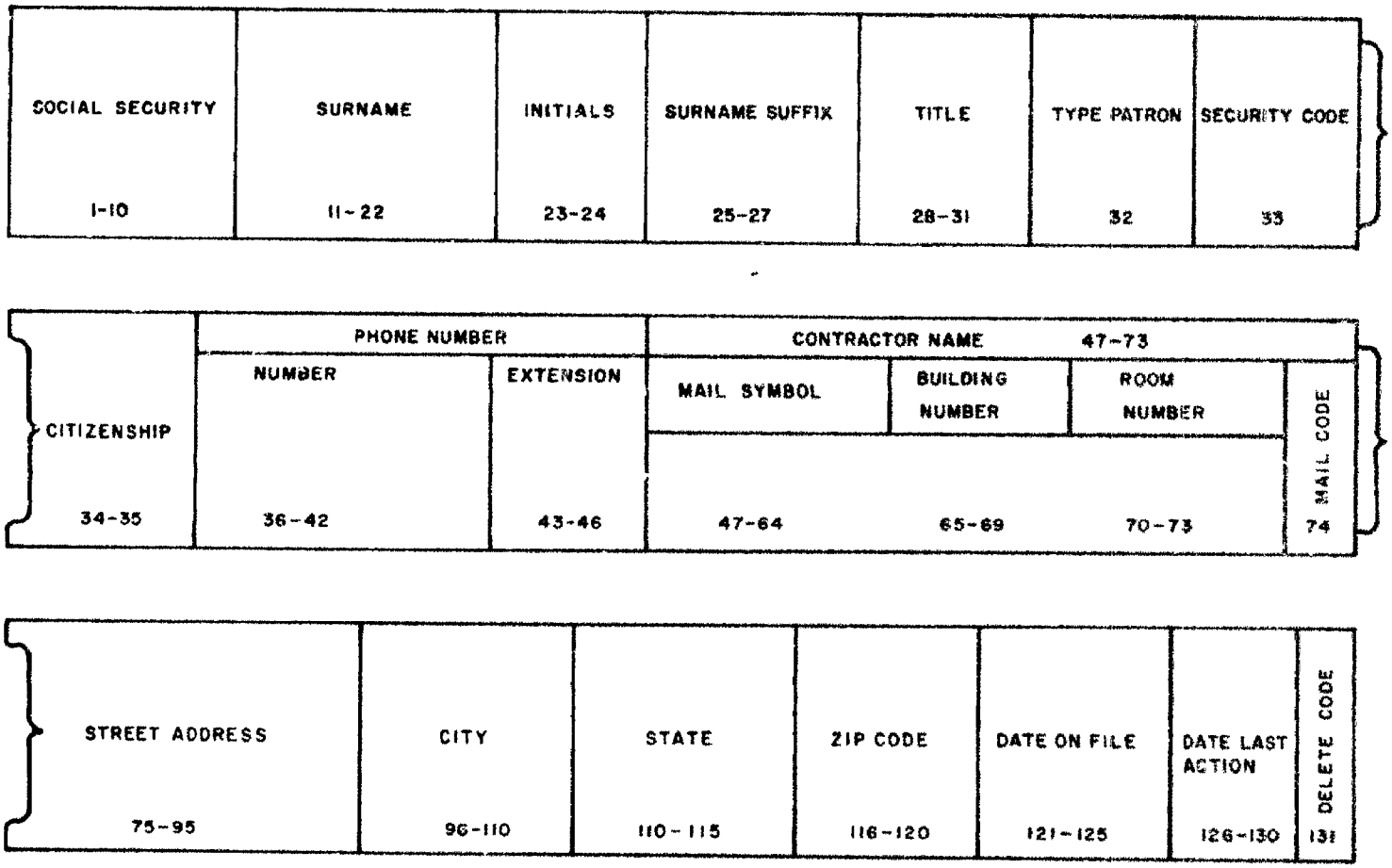


Figure 31. Updated Patron Master

PATRON DELETE - ADDED ON 21 JAN 66 DELETED ON 1 JUN 66

LINE a 1410-48-2001 WILLIAMSONbb J. W. JRb. LCOL M S 01

LINE b ORGANIZATION SYMBOL BLDGXXXXX RMXXXX PHXXXXXXX XXXX

LINE c STREET ADDRESSXXXXXXX CITYXXXXXXXXXXX STATE ZIPCD

Figure 32. Deleted Patron Record

01 JAN 66 PATRON LIST IN SOCIAL SECURITY NUMBER SEQUENCE PAGE 00001

ENTRIES FROM THE PATRON RECORD ARE AS FOLLOWS:

SOCIAL SECURITY NO., NAME, INITIALS, TITLE, PATRON TYPE, CLEARANCE, CITIZENSHIP, PHONE NO., EXTENSION, ORGANIZATION, BUILDING NUMBER, ROOM NUMBER, DELETE STATUS

---

01 JAN 66 PATRON LIST IN SOCIAL SECURITY NUMBER SEQUENCE PAGE 00001

1410-48-2001 WILLIAMSON, JW JR., LCOL MIL S 01 876-5432, EXT 1234, AMSMI-RB, BL 4484 D

0411-38-2837 CARLETON, MIL MAJ U 01 876-3485

Figure 33. List of Patrons by Social Security Number Sequence

01 JAN 66 PATRON LIST IN NAME SEQUENCE PAGE 00001

ENTRIES FROM THE PATRON RECORD SORTED TO NAME SEQUENCE ARE AS FOLLOWS:

FIRST LINE:

NAME, INITIALS, SUFFIX TITLE, TYPE PATRON, PHONE NUMBER, EXTENSION, ORGANIZATION OR NAME OF COMPANY.

SECOND LINE:

SOCIAL SECURITY NUMBER, BUILDING, ROOM NUMBER, STREET, CITY, STATE, ZIP CODE, SECURITY CLEARANCE, CITIZENSHIP, AND DELETE STATUS.

---

01 JAN 66 PATRON LIST IN NAME SEQUENCE PAGE 00001

WILLIAMSON J. W. JR LCOL NASA 876-1234 ORGANIZATION OR CONTRACT NAME

4810-48-1234 BL 1284 RM 1111 2115 SAN JACINTO ST. DALLAS TEX 12345 (S) 01

Figure 34. List of Patrons by Name Sequence

01 JAN 66 TRANSACTION MONITOR PAGE 0001

THIS IS A LIST OF ALL INPUT TRANSACTIONS TO THE PATRON MASTER FILE AND BOOK CIRCULATION TRANSACTIONS WHICH WERE INPUT TO THE SYSTEM FOR THE PROCESSING PERIOD. NOTATIONS TO THE LEFT INDICATE THE DECODED ACTION CODE, I. E., NEW FOR NEW PATRONS ADDED, CHG FOR PATRON DATA CHANGES, DEL FOR PATRON DATA DELETED, AND CIR FOR CIRCULATION TRANSACTIONS. THE NOTATION TO THE LEFT INDICATES ERROR CONDITIONS FOR TRANSACTIONS THAT DID NOT PROCESS.

---

01 JAN 66 TRANSACTION MONITOR PAGE 0001

NEWxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxPATRON-TXxxxxxxxxxxxxxxxxxxxxxxxxxxxxxSSN NOT IN FILE

NEWxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxPATRON-TXxxxxxxxxxxxxxxxxxxxxxxxxxxxxxINV SSN

CHGxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxPATRON-TXxxxxxxxxxxxxxxxxxxxxxxxxxxxxxINV SURNAME

DELxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxPATRON-TXxxxxxxxxxxxxxxxxxxxxxxxxxxxxxINV SSN NO.

CIRxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxCIRC-TXxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxINV SSN NO.

CIRxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxCIRC-TXxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

NEWxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxPATRON-TXxxxxxxxxxxxxxxxxxxxxxxxxxxxxPATRON NOT IN FILE

CHANGExxxxxxxxxxxxxxxxxxxxxxxxxxxxxxPATRON-TXxxxxxxxxxxxxxxxxxxxxxxxxxxxx

NEWxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxPATRON-TXxxxxxxxxxxxxxxxxxxxxxxxxxxxx

CIRxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxPATRON-TXxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Figure 35. Transaction Monitor with Error Messages for Unprocessed Transaction

Section V. LARGE SCALE CONTROL SYSTEM

1. Large Scale Off-Line Control System

The large scale off-line computer system for library circulation and control is a further extension of the systems previously discussed. The only significant difference between the large scale computer system and the small scale computer system is the number of positions allowed for recording the patron's name. The large scale system permits the recording of the patron's full name in lieu of last name and initials.

Libraries that are considering mechanization of functions should consider the size of the library, activity, and availability of equipment when selecting between the small scale computer system and the large scale computer system.

In the event that conversion is to be accomplished from small scale computer to large scale computer, it would be appropriate when converting the patron master file to machine prepare a patron request card, Form 10, less the patron's initials, and forward the printed form to the patrons requesting verification of all entries and additional name data. The verified forms will be used to complete or correct the master record, insuring a complete and accurate patron data file.

Paragraph 2 below outlines the patron control system, products, and their use. Paragraph 3 outlines the circulation system, products, and their use.

2. Large Scale Off-Line Patron Control System

a. Introduction

The purpose of the patron control system for large scale computer processing is as follows:

1) To validate social security number and patron name on items charged.
2) To provide mailing addresses for production of notices to patrons.
3) To provide reference for correction of processing errors.
4) To maintain a register of all valid patrons.

b. File Maintenance and Input Preparation

Maintenance of the patron master file is accomplished through the submission of appropriately annotated Forms 10 to the keypunch operator (Figure 36). Actions which can be requested are as follows:

1) Establishment of new patrons on the file.
2) Revision of established patron records.
3) Complete removal (purge) of patron records from the file.

Each of these actions is discussed in detail in subparagraphs (1), (2), and (3).

(1) Establishment of New Patrons on the Master File.

To establish a new patron on the file, it is first necessary to verify that the patron is not already on the file through the use of the patron list in social security sequence. The procedure for accomplishing this with all exception conditions is outlined as follows. If the patron is not on the file, he may be added. If, however, the social security number of the patron to be added to the patron file is already present in the patron file, one of the following conditions, which must be determined by research, is indicated:

1) The number being added is incorrect and accidentally agrees with the number of another established patron. In this case, the correct number must be obtained and submitted.
2) The patron is already correctly established on the patron file. If this is the case, review the Form 10 and the patron record to determine if the Form 10 contains information not in the patron record or contains more current information. If this is the case, the change action should be submitted (see subparagraph (3)).
3) The number being added is correct and the number which it matches is incorrect. In this case, the record on the patron master must be deleted and resubmitted with the correct number.

For each new patron to be added to the file, it is necessary to submit a Form 10 to the keypuncher containing the action code A and the following minimum amount of information:

1) Surname and given names (include suffixes such as Jr. and Sr. and titles such as Dr. or Lt. Col., if available).
2) Social security number.
3) Office symbol or standard mailing address (both may be included).
4) Security clearance (indicate UNCLEARED if not known).
5) Employee type (NASA, Army, contractor, military, or other).
6) Citizenship (specify by country or indicate as unknown).
7) Company name, if contractor.

If available, the following elements of information should be included also:

1) Building number.
2) Room number.
3) Phone number.
4) Extension.

(2) Revision of Established Patron Records. Before submitting Forms 10 containing changes to established records, it is necessary to verify that the record to be changed is an established record by checking the patron list in social security number sequence. Normally, the number is found and the name and other data agree with the Form 10. If this is the case, the change may be submitted as valid. If, however, the social security number of the patron on the Form 10 change card is not present on the patron file in social security number sequence, one of the following conditions, which must be determined by research, is indicated:

1) The patron in question is presently not established on the patron file. If this is the case, he must be established as a new patron.
2) The patron in question is established on the patron file under a correct social security number, but the number appearing on the Form 10 is incorrect. If this is the case, correct the Form 10 and resubmit.
3) The number appearing on the Form 10 agrees with an entry on the patron file which is entered under the wrong social security number. When this situation exists, the incorrect record must be purged from the patron file, corrected, and reentered under the correct social security number.

Revisions to established records consist essentially of the following actions:

1) Adding data elements to established records.
2) Deleting data elements from established records.
3) Changing data elements that are present in established records.

Forms 10 submitted for the purpose of revising established records must contain the following:

1) Action code C.
2) Social security number.
3) Surname.
4) The data elements to be added or changed. If data elements are to be deleted, simply place an asterisk or star in the information box of the element to be deleted. It is possible to add, change, and delete information elements simultaneously. For example, one may change the organizational symbol of a patron, delete the old room number, and add a new telephone number all on one Form 10 submission.

Employee type and contractor code may not be altered by a change transaction. When these elements change, it is necessary to purge the old record and reestablish it in its entirety as a "new."

A special option has been included in the program for revising the name of established patrons. This is accomplished by submitting a Form 10 with the notation "change" containing the social security number and the surname, given names, and surname suffix, if any. No other action should be included on the Form 10 when a name change action is being accomplished as the absence of other change data identifies such an action for the keypuncher as a name change.

Social security number changes must be accomplished by the submission of a purge action (see subparagraph (3)) to delete the incorrect number and by the submission of an add action establishing a new patron record under the correct number.

(3) Complete Removal (Purge) of Patron Records from the File. To delete completely (purge) a patron record from the file, it is first necessary to verify that the record to be deleted is an established record by examining the patron file in social security number sequence. Normally, the record to be deleted will be found there and the name will agree. In this case, the Form 10 should be forwarded to

the keypuncher. Forms 10 submitted for the purpose of deleting established records must contain the following:

1) Action code D.
2) Social security number.
3) Patron surname.

If, however, the number is found on the patron file with data about another patron, one of the following is true:

1) The social security number appearing on the Form 10 is incorrect and accidentally agrees with the social security number of an established record. In this case, the social security number of the Form 10 should be corrected.
2) The record on the patron file is incorrect and must be deleted and added back under its correct number.

If the social security number appearing on the Form 10 is not present in the patron file in social security number sequence, the name should be looked up in the complete patron file in name sequence. If the record is found there under another but correct number, the number on the Form 10 should be made to agree with the number found.

If both the social security number and the patron name are not found in any listing, it is possible that the patron record has already been deleted. This can be verified by looking in the 5-by-8 patron record delete file. If the record appears there, no further action is necessary since the delete has already been accomplished.

Book circulation transactions are also processed through the edit programs of the patron master file for validation of social security code. This is accomplished by matching against the patron file on social security number, surname, and given name and initials. If the transaction does not match the patron file, the transaction will be matched against the preceding patron transaction. If it is unmatched for both conditions, the circulation transaction will be flagged as an error. If the circulation transaction does not match the patron file but does match the patron transaction and the patron transaction is flagged with an error message, the circulation card will also be flagged as unprocessed.

c. Computer Outputs from the Patron Control System

(1) Complete Patron List in Name Sequence (Figure 37). The purpose of this listing is to provide a comprehensive formatted

display of the total contents of the patron master file. The list is in sequence by patron surname and given names and is an optional output of the update of the patron master file. Because of the size of the printout, it will normally be produced weekly, even though updates may be accomplished daily.

The index entry point to this list is via surname and given names, as mentioned. If it is necessary to enter the file via social security number, this may be done by first extracting the proper name from the patron list in social security number sequence.

Although the prime function of this file is to display the complete set of patron data for usage such as routing and need-to-know control, it also serves as a research document in the correction of update errors.

(2) Patron List in Social Security Number Sequence (Figure 38). The purpose of this listing is to provide an abbreviated display of selected elements of patron data (locater and security data) and to relate social security number to surname and given names. Since the patron file is maintained in social security number sequence, this is a particularly important file for reference purposes and in determining name and other data when only the social security number is known. It is also a valuable document in researching errors noted on the patron monitor.

(3) Patron Record Deletes. Patron record deletes (Figure 39) are produced as a result of the complete deletion (purge) of a patron record from the master file. The purpose of the patron record delete card is to provide a historical record of deleted patron data. The immediate use of this card will be to verify that the deleted patron has cleared the library properly. In the event that a patron is inadvertently deleted, this record can serve as a convenient source of data for the reestablishment of the patron on the patron master file. This file can also serve as a research tool in determining if the absence of a patron's name from the file is a result of its having been deleted.

These cards will be forwarded to the documents section and filed by surname. They will be retained for two years.

(4) The Patron Monitor (Figure 40). The patron monitor has been established for the purpose of monitoring all actions against the patron file, as well as circulation transactions, to assist in the correction and resubmission of error corrections, and to provide a statistical summary of the patron status. The following legend, which appears on the first page of every monitor, explains its function: "This

is a complete list of all input transactions to the patron master file and is in order by social security number. Notations to the left of the transactions consist of the decoded action code of the transaction, i. e., NEW for new patron data added for the first time, CHG for all transactions changing or revising established records, and PRG for records being completely deleted or purged from the file. Notations appearing on the right are error messages explaining why the adjacent transaction was not processed. Research and corrective action can be accomplished with the transaction cards forwarded with this listing."

It should be noted that in the editing process all data are evaluated in terms of the card code appearing in each card. For example, if the card code is 01 (name card), the data on the card, correct or otherwise, is assumed to be name data and is so edited. Therefore, in those instances where a card has the wrong card code and otherwise "correct" data, the resulting error messages can be misleading.

All error messages are listed alphabetically and explained in detail together with suggested corrective actions as follows:

Message	Meaning	Corrective Action
ALREADY IN FILE	This transaction, coded as new, matches on social security number a patron record already in the patron file. Either (1) the social security number of the transaction is in error and accidentally matches a record in the file or (2) the transaction should have been been coded as change.	Correct and resubmit.
BLANK DATA FIELD	Columns 30-78 of the transaction card contain no data (all blanks).	Resubmit card with desired data or discard.
CL 57-78 NOT BLANK	This name change transaction card contains non-blank data in columns 57-78 and should normally contain data in columns 1-56 only.	Eliminate extraneous data in columns 57-78 and resubmit.

Message	Meaning	Corrective Action
CL 57-78 BLANK	This name card, coded as change, contains nothing to change in columns 57-78.	Supply data to be changed and resubmit.
INV ACTION CODE	The action code (column 1) of the transaction is either invalid or inconsistent with the card code. For card codes 1-3 (column 2), the action code must be either N (new), C (change), or / (name change) only. For card code 0, the action code must be P (purge) only.	Correct the action code if invalid. If inconsistent with the card code, change the action code or card code as appropriate.
INV CARD CODE	The card code (column 2) is not one of the codes 0-3.	Correct and resubmit.
INV CITIZENSHIP	The citizenship code (columns 59-60) is not all numeric.	Correct and resubmit.
INV CLEARANCE	The patron security clearance (column 58) is not one of the following: U = Uncleared, C = Confidential, S = Secret, or T = Top Secret.	Correct and resubmit.
INC CONTRACTOR	The contractor code (columns 75-78) is either missing or is incorrectly recorded. A valid contractor code is required since column 57 specifies C for contractor.	Supply the correct contractor code, correct the patron type, or notify computation laboratory that this is a new contractor, whichever is in error.
INV EXTENSION	The telephone extension (columns 71-74) is not all numeric.	Correct and resubmit.

Message	Meaning	Corrective Action
INV GIVEN NAMES	The given names (columns 30-47) contain characters other than alphabetics, periods, dashes, or begin with a blank or invalid character.	Correct and resubmit.
INV PHONE NR.	The telephone number (columns 64-70) is not all numeric.	Correct and resubmit.
INV PURGE CARD	Columns 30-78 of the purge card contain nonblank data and should be blank.	Correct and resubmit.
INV TYPE CODE	The patron type (column 57) is not one of the following: N = NASA, A = Army, M = military, C = contractor, or O = other.	Correct and resubmit.
INVALID SSN	The social security number appearing on this transaction is not all numeric.	Correct and resubmit.
INVALID SURNAME	The surname (columns 14-29) contains characters other than alphabetics, dashes, or blanks, or the initial letters of the name have a misplaced blank.	Correct and resubmit.
NAME UNCHANGED	This name change transaction contains name data identical to that already posted for the patron.	Supply the correct name and resubmit.
NOT CONTRACTOR	Although this patron is not a contractor, something appears in the company code field (columns 75-78) of this card.	Remove the data in the company code field or change the patron type to contractor.

Message	Meaning	Corrective Action
SSN NOT IN FILE	The social security number appearing on this transaction is not in the master file. It may be that the number on the transaction is incorrect or the item to which it should match was never added to the master file or has been dropped inadvertently.	Research the problem and resubmit as required.
UNMATCHED SURNAME	This transaction matched the master file on social security number but did not match on surname. Any of the following could be true: (1) the surname on the master file is incorrect, (2) the surname on the transaction is incorrect, (3) the social security number of the transaction is incorrect and accidentally matched a record already on the master file.	Research and resubmit.

The following three error messages have been added as a result of program changes:

Message	Meaning	Corrective Action
INV CHANGE	A name card (card code 1) was submitted with data in one or more of the following fields. Changes in these elements of information cannot be accomplished with a change transaction: (1) given names or surname suffix, (2) patron type, (3) contractor code.	Research and resubmit.

Message	Meaning	Corrective Action
INV NAME CHANGE	A name change transaction was submitted with extraneous data on the card, i.e., data other than surname, given names, or surname suffix.	Eliminate extraneous data and resubmit.
INV ROOM NR.	A change was submitted on the patron's building number but no change on room number was included.	Delete room number.

(5) Unprocessed Transactions in Card Form. These cards, generated during every update, represent input transactions not processed because of error and are returned for research and possible correction and resubmission. Each card returned is also listed on the patron monitor together with a message explaining the cause of error.

Normally, the person responsible for the correction and resubmission of error cards would use the patron monitor and other listings to determine the necessary corrective action. When this is accomplished, the required changes are made to the card and it is resubmitted. Since all cards are returned minus the original action code in column 1, it is necessary to indicate the correct action to be used for resubmission. The original action code may be obtained, if required, from the patron monitor. Often, the only change required will be a change in the action code in column 1.

Tabulated below are the program transaction editing criteria:

Column	Data Element	Editing Criteria	Error Messages
1	Card code	Must be 00 through 07 or 09	INV CARD CODE
2	Action code	Must be N or C or / except where card code is 00, in which case must be P	INV ACTION CODE

Columns	Data Element	Editing Criteria	Error Messages
3-13	Social security number	Must be all numeric	INVALID SSN
14-29	Patron surname	Initial characters must be of the form XX or XbXX or XXbXX where X's are valid alphabetic characters. All nonblanks in the patron surname must be valid alphabetic characters or dashes. No multiple blanks are permitted in the surname; if these occur, they will be closed up to one blank, i.e., MACbbHENRY will be changed to MACbHENRY.	INVALID SURNAME
30-78	Data fields	Must be nonblank if card code is 01 through 07 or 09.	BLANK DATA FIELD

The purge card (card code 1) (Figure 41) will be edited as follows:

Columns	Data Element	Editing Criteria	Error Messages
30-78		Must be blank.	INV PURGE CARD

The name card (card code 1) (Figure 41) will be edited as follows if action code is A:

Columns	Data Element	Editing Criteria	Error Messages
30-47	Given names	First character must be alphabetic. All nonblank characters must be alphabetic, periods, or dashes only.	INV GIVEN NAMES

Columns	Data Element	Editing Criteria	Error Messages
57	Patron type	Must be A, C, N, M, or O	INV TYPE CODE
58	Security code	Must be U, C, S, or T	INV CLEARANCE
59-60	Citizenship code	Must be all numeric	INV CITIZENSHIP
64-70	Telephone number	Must be all numeric or blank	INV PHONE NR.
71-74	Extension number	Must be all numeric or blank	INV EXTENSION
75-78	Contractor code	Must be all numeric if column 57 is C	INV CONTRACTOR
		Must be blank if column 57 is not C	NOT CONTRACTOR

The name card (card code 1) will be edited as follows if the action code is C:

Columns	Data Element	Editing Criteria	Error Messages
30-50	Given names and surname suffix	Must be blank or will be blanked by program	INV CHANGE
57	Patron type	Must be blank or will be blanked by program	INV CHANGE
58	Security type	Must be blank or U, C, S, or T	INV CLEARANCE
64-70	Telephone number	Must be blank or *bbbbbb, or all numeric	INV PHONE NR.
71-74	Extension number	Must be blank or *bbb, or all numeric	INV EXTENSION
75-78	Contractor code	Must be blank	INV CHANGE

Tabulated below are the update editing criteria and processing actions:

Card Code	Action Code	Edit Check	Error Message	Action if Valid Transaction
0 Purge Card	D	Must match a patron record on social security number	SSN NOT IN FILE	Delete complete patron record and write out on purged master record file
		Must also match a patron record on patron surname	UNMATCHED NAME	
1 Name Card	A	Must not match any patron record on social security number	ALREADY IN FILE	Establish new patron master record
	C	Must match a patron record on social security number	SSN NOT IN FILE	
		Must also match a patron record on patron surname	UNMATCHED NAME	Replace appropriate fields (except surname) in patron master with corresponding nonblank fields from transaction card. If nonblank fields in transaction card have an initial asterisk, blank out corresponding field in master record. If card code is 01 and action is /, surname is included as field to be changed.

Card Code	Action Code	Edit Check	Error Message	Action if Valid Transaction
2 Local Address Card	A	Must not match any patron record on social security number	ALREADY IN FILE	
	C	Must match a patron record on social security number	SSN NOT IN FILE	
		Must also match a patron record on patron surname		
3 Address Card	A	Must not match any patron record on social security number	ALREADY IN FILE	Replace appropriate fields in patron master with corresponding nonblank fields from transaction card. If nonblank field in transaction has an initial asterisk, blank out corresponding field in master record.
	C	Must match a patron record on social security number	SSN NOT IN FILE	
		Must also match a patron record	UNMATCHED NAME	

(6) Complete Patron List in Name Sequence. Each patron entry appearing in the complete patron list in name sequence (Figure 37) is to be assembled from the nonblank fields present in each patron master record (Figure 42) for display on 8½- by 11-inch stock. Both input and output will be in sequence by patron surname, given names, surname suffix, and title.

The first page of the report should contain the legend shown on the upper half of Figure 43. The detailed production of each print line is discussed line by line below.

(a) Line a — Patron surname, given names, surname suffix, and title are to be normalized and displayed as shown on the left-hand side of the line. The balance of the line, beginning in column 46, is in fixed field format for the following data elements:

1) Type code (decoded, A = Army, N = NASA, C = CONT, M = MILB, and O = OTHR).
2) Area code preceded by constant AC.
3) Telephone number with inserted dash.
4) Extension with constant EXTb
5) Company name, if any.

(b) Line b — Insert dashes in the social security number. Follow this with the organizational symbol, building number (with constant BLb), room number (with constant RMb) in normalized form. On the right side, beginning in column 46, display the mailing address elements in normalized form. If mailing address is not present, the right half of the line will be blank.

(c) Line c — Immediately after the constant CITIZENb insert the decoded country name. A list of not more than 99 names will be provided which relate the two-digit code to the actual country name. Following this will be the decoded need-to-know type code (N = NASA and C = COSATI). If the need-to-know type code is N, the constant NASA should appear in positions 29 through 32; if it is C, the constant COSATI should appear in positions 27 through 32. The decoded type code should be followed by the constant N-T-KbCODES in positions 34 through 44. Following this, beginning in position 46, are the decoded need-to-know codes with leading zeroes eliminated and each separated by commas. If more than one line is required for the decoded need-to-know codes, they will be printed on multiple lines each beginning in position 46. If the individual is authorized all the need-to-know codes for a particular type, the notation ALL, rather than a list of all the codes, should appear in positions 46 through 48.

(d) Line d — This line should begin with the constant CLEARANCEb followed by the decoded clearance code enclosed in dashes, i.e., - SECRET - for S. Comments, if any, should appear on the right side beginning in position 46 and should be preceded by the constant COMMENTSb(X) where X is the number of the comment. There may be as many as three numbered comments.

(7) Patron List in Social Security Number Sequence. The patron list in social security number sequence (Figure 38) is to be assembled from the data elements tabulated on pages 106, 107, and 108.

for display on 8½- by 11-inch stock. Since every patron record will not contain all these elements of information and, further, certain of the data elements may vary considerably in actual length, it is necessary that the print lines be constructed by "floating" in the data elements when present in the order listed on pages 106, 107, and 108. This technique will be referred to henceforth as normalizing the print line.

Data elements with a "No" in the "Required" column must be tested to determine the presence of nonblank data; if nonblank data are present, the data element will be included in the print line. All elements with the notation "Variable" in the "Length Adjustment" column will be moved without terminal blanks and the print line adjusted accordingly. Appropriate punctuation marks (blanks, commas, etc.) will be inserted between data elements as indicated in Figure 37.

The first page of the report should consist of the explanatory or "legend" data shown on the upper half of Figure 40.

(8) Purged Master Record Report. This report, shown in Figure 39, will be constructed for every patron deleted from the patron master file. To simplify the production of this report, efforts have been directed toward the use, whenever possible, of the data fields exactly as they appear in the patron master record. In certain instances fixed lengths constants have been inserted to improve readability.

(a) Line a — This line is formatted using the field length present in the patron master record with the exception that dashes are inserted in the social security number and the constant CONTb precedes the company code. For missing (blank) data elements, the corresponding fields in this line are left blank.

(b) Line b — This line is formatted using the field lengths of the data in the patron master record. The constants RM (room), BL (building), AC (area code), EXT (extension), and MISC (miscellaneous) precede the field if the field is nonblank. A dash is also inserted in the telephone number.

(c) Line c — This is an optional print line produced only when these elements of data are present.

(9) Patron Statistical Report. This summary report (Figure 43) should immediately follow the last page of the patron monitor and is formatted for display on 8½- by 11-inch stock. Although the report is generally self-evident, comments on certain of the print lines are included below for clarification.

(a) Line a – The date shown here is the date of the last update or the date of the origination of the patron master input file.

(b) Line b – The number of patrons added is the number of valid 1 cards processed with action codes of A. It represents the number of new patron records created.

(c) Line c – The number of patrons deleted represents the number of patron records deleted from the file as a result of processing valid 1 cards with an action code of D.

(d) Line d – This number represents the number of valid input transactions processed with an action code of C only.

(e) Line e – This number represents the number of input transactions which fail the edits and are not processed.

(f) Line f – This number represents the total number of input transactions.

(g) Line g – The number of patrons shown here is the number of patron records appearing on the updated output patron file produced during this update cycle.

3. Large Scale Circulation Control System

The purpose of the circulation control system for large scale computer processing is as follows:

1) Circulate books to waiting patrons.
2) Correct errors in circulation and patron file.
3) Discharge circulated books.
4) Circulate through mail.
5) Maintain the status of all books.
6) Recall books for reprocessing.
7) Recall books on loan for another patron.
8) Submit overdue notices to patrons.

The preparation of the circulation card and operating functions are outlined in Section IV, Paragraph 1. Therefore, this paragraph is confined to discussion of computer runs and reports generated (Figure 44).

The circulation system is comprised of six computer runs, the functions of which are described as follows:

1) Run 1. Sorts the transactions to LC number sequence.
2) Run 2. Updates the circulation master file.
3) Run 3. Prints circulation list in call number sequence.
4) Run 4. Prints circulation statistical report error lists and punches error cards.
5) Run 5. Sorts recall and overdue notices.
6) Run 6. Prints recall and overdue notices.

As shown in the systems chart (Figures 45 and 46), the main update run accepts a variety of transaction types which are used to update the master circulation file. Each transaction record is first edited during the edit run according to type. If it passes the edits, it is then processed against the master circulation file. During the update run, a weekly circulation listing file is created (Figure 47). This file is sorted to patron name sequence, and two reports are printed, one in call number sequence (Figure 48) and one in patron name sequence (Figure 49).

A circulation error listing (Figure 50) is produced in the update run. The error listings produced will contain an error message and an image of the transaction in error. An example of the error messages is shown in Figure 51.

To provide for the recall of books that need to be reclassified, are overdue, or are needed by another patron, special message codes along with the circulation record are written onto an output tape during the regular updating run. This output-recall-renewal tape is sorted to patron social security number sequence and passed through a notice writing program, producing various notices (Figures 52, 53, 54, and 55). The renewal and overdue message codes are produced automatically by the update program and require no additional transactions since they are triggered by the original loan date (Figure 56).

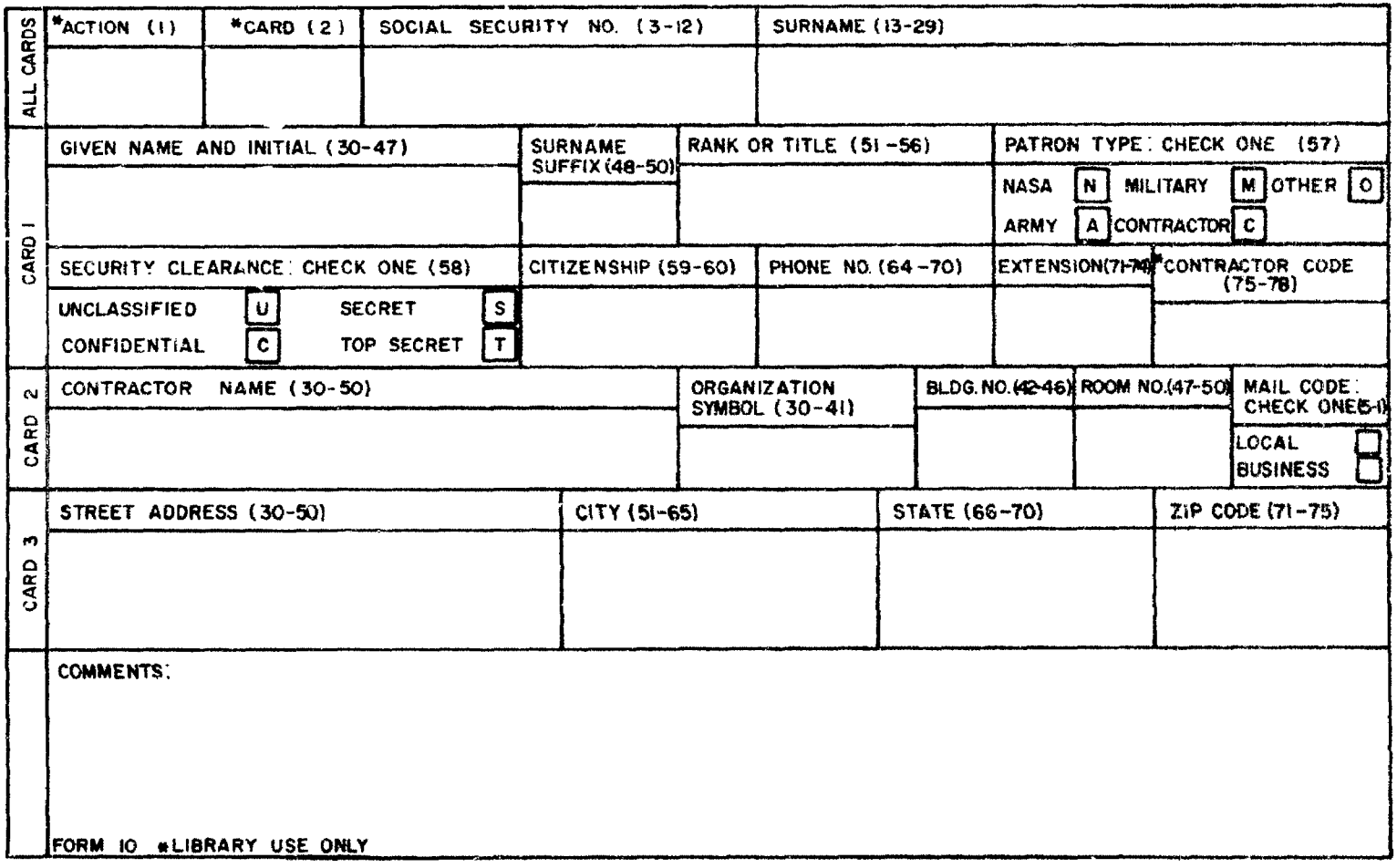


Figure 36. Patron Request Card

01 JAN 64 COMPLETE PATRON LIST IN NAME SEQUENCE PAGE 00001

THIS IS A COMPLETE LIST OF ALL RSIC PATRON DATA ARRANGED IN ORDER BY PATRON NAME (SURNAME AND GIVEN NAMES). THE FIRST LINE OF EACH ENTRY CONSISTS OF SURNAME, GIVEN NAMES, SURNAME SUFFIX, TITLE, TYPE EMPLOYEE, AREA CODE, TELEPHONE NUMBER, EXTENSION, AND COMPANY NAME, IF CONTRACTOR. THE SECOND LINE CONSISTS OF SOCIAL SECURITY NUMBER, ORGANIZATIONAL SYMBOL, BUILDING AND ROOM NUMBERS, AND MAILING ADDRESS, IF ANY. THE THIRD LINE CONSISTS OF COUNTRY OF CITIZENSHIP.

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01 JAN 64 COMPLETE PATRON LIST IN NAME SEQUENCE PAGE XXXXXX

(a) WILLIAMSON, JAMES B., JR., LT COL NASA AC 705 876-5432 EXT 1234 COMPANY----NAME
(b) 410-48-2001 AMSMI-RB-XYZ BL 12345 RM 12345 2115 SAN JACINTO ST., DALLAS, TEXAS, 12345
(c) CITIZEN UNITED KINGDOM
(c) CLEARANCE-CONFIDENTIAL- COMMENT (1) ACCORDED ACCESS TO AEC ORIGINATED FILES

Figure 37. Complete Patron List in Name Sequence

01 JAN 64 PATRON LIST IN SOCIAL SECURITY NUMBER SEQUENCE PAGE 00001

THIS IS A LIST OF RSIC PATRONS ARRANGED IN ORDER BY SOCIAL SECURITY NUMBER. EACH LINE CONTAINS SELECTED ELEMENTS OF PATRON DATA, ALL OF WHICH APPEAR IN THE COMPANION LIST ARRANGED ALPHABETICALLY BY NAME.

THE ENTRIES TAKE THE FOLLOWING FORM: SOCIAL SECURITY NUMBER, NAME, TITLE, EMPLOYEE TYPE, CLEARANCE, CITIZENSHIP CODE, TELEPHONE NUMBER, EXTENSION, ORGANIZATIONAL SYMBOL, AND BUILDING NUMBER, AS SHOWN BELOW.

410-48-2001 DOE, JOHN Q., JR., LT COL, NASA(S) US 876-5432, EXT 1234, AMSMI-RB, BL 4491

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01 JAN 64 PATRON LIST IN SOCIAL SECURITY NUMBER SEQUENCE PAGE XXXXX

410-48-2001 WILLIAMSON, JAMES B., JR., LT COL., MIL (S) US 876-5432, EXT 1234, AMSMI-RB, BL 4491
410-49-2938 HOWERTON, PAUL K., NASA (S) US 881-4857
410-50-2039 WILLIAMS, P. K., ARMY (U) US 881-3847
411-38-2837 CARLETIN, M. M., MAJ , MIL (U) US 876-3485, AMSMI-RR, BL 4491

Figure 38. Patron List in Social Security Number Sequence

PATRON RECORD DELETES ADDED ON 21 JAN 65 DELETED ON 27 MAR 65

LINE a 410-48-2001 WILLIAMSONbbbbbb JAMES B. bbbbbbbbbb III LT COL N S 01 CONTb 1234
LINE b AMSMI-RBbbbb RMb12345 BLb12345 ACb123 876-3728 EXTb1234 MISCbXXXXXXXXXX
LINE c 2115 SAN JACINTO ST. b DALLASbbbbbbbbb TEXbb 12345

Figure 39. Patron Record Deletes

01 JAN 64 PATRON MONITOR PAGE 00001

THIS IS A COMPLETE LIST OF ALL INPUT TRANSACTIONS TO THE PATRON MASTER FILE AND IS IN ORDER BY SOCIAL SECURITY NUMBER. NOTATIONS TO THE LEFT OF THE TRANSACTIONS CONSIST OF THE DECODED ACTION CODE OF THE TRANSACTION, I. E., ADD FOR NEW PATRON DATA ADDED FOR THE FIRST TIME, CHG FOR ALL TRANSACTIONS CHANGING OR REVISING ESTABLISHED RECORDS, AND DEL FOR RECORDS BEING COMPLETELY DELETED OR PURGED FROM THE FILE. NOTATIONS APPEARING ON THE RIGHT ARE ERROR MESSAGES EXPLAINING WHY THE ADJACENT TRANSACTION WAS NOT PROCESSED. RESEARCH AND CORRECTIVE ACTION CAN BE ACCOMPLISHED WITH THE TRANSACTION CARDS FORWARDED WITH THE LISTING.

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01 JAN 64 PATRON MONITOR PAGE XXXXX

```
      ADD**********************************PATRON-TX**************************
      ADD**********************************PATRON-TX************************** SSN NOT IN FILE
      CHG**********************************PATRON-TX************************** ALREADY IN FILE
      CHG**********************************PATRON-TX**************************
CHG or ADD********************************PATRON-TX************************** INVALID SSN
      CHG**********************************PATRON-TX**************************
      ADD**********************************PATRON-TX************************** INVALID SURNAME
      CHG**********************************PATRON-TX**************************
      CHG**********************************PATRON-TX**************************
          ********************************PATRON-TX************************** INVALID ACTION CODE
      CHG**********************************PATRON-TX**************************
      CHG**********************************PATRON-TX**************************
      CHG**********************************PATRON-TX************************** INV TYPE CODE
      CIR**********************************CIRCUL-TX**************************
      CIR**********************************CIRCUL-TX************************** INVALID SURNAME
```

Figure 40. Patron Monitor

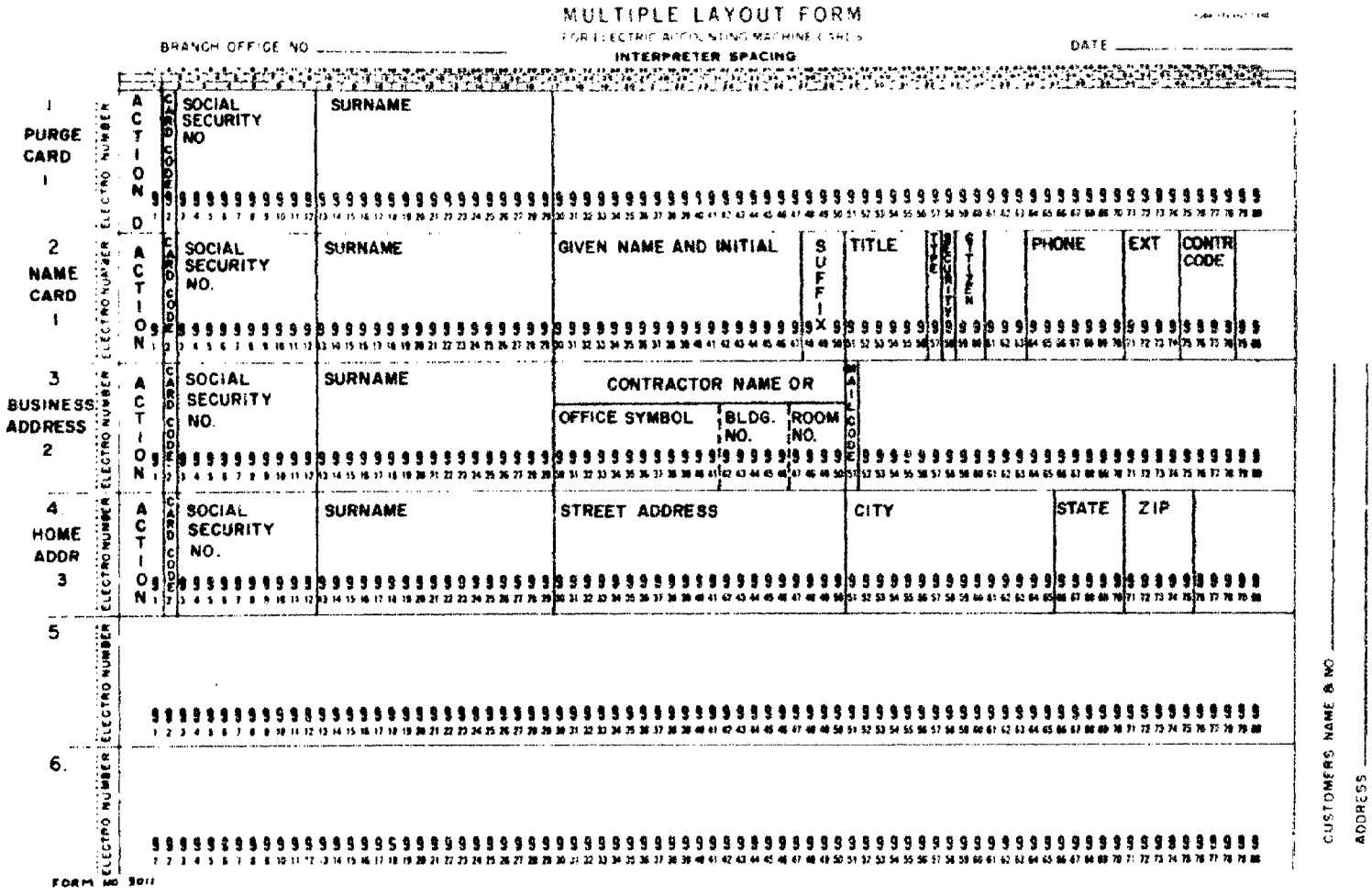

Figure 41. Purge Card and Name Card

COMPUTER RECORD DESIGN FORMAT	RECORD TITLE: PATRON CONTROL MASTER FILE	NUMBER OF CHARACTERS: 144
TYPE RECORD: FIXED	DESIGNED BY: MICOM COMPUTATION CENTER	DATE: 1 OCT 66

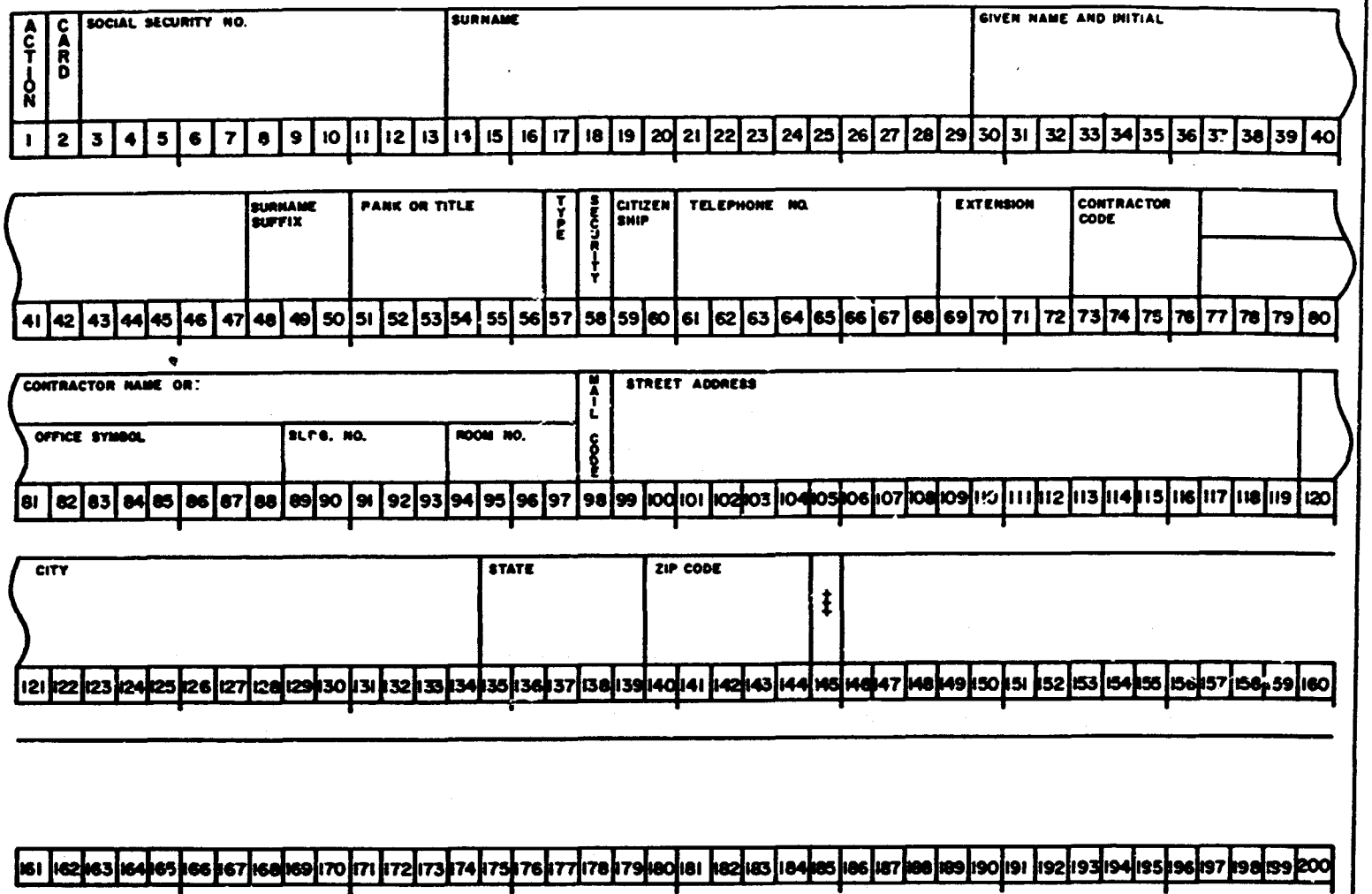

Figure 42. Patron Control Master File

01 JAN 64 PATRON STATISTICAL REPORT PAGE 1 of 1

(a) THERE WERE XX, XXX PATRONS IN FILE AS OF 01 DEC 63. SINCE THAT TIME THE FOLLOWING ACTIONS HAVE TRANSPIRED -

(b) XXXX PATRONS ADDED
(c) XXXX PATRONS DELETED
(d) XXXX PATRON RECORDS CHANGED
(e) XXXX UNPROCESSED TRANSACTIONS
(f) XXXX TOTAL TRANSACTIONS

(g) THERE ARE NOW XX, XXX PATRONS IN FILE AS OF 01 JAN 64. THEIR VARIOUS STATUSES ARE SHOWN IN THE STATISTICAL BREAKOUT BELOW

PATRON TYPE	TOTAL PER TYPE	WITH CLEARANCES	WITHOUT CLEARANCES
ARMY	XXXX	XXXX	XXXX
NASA	XXXX	XXXX	XXXX
MILITARY	XXXX	XXXX	XXXX
CONTRACTOR	XXXX	XXXX	XXXX
OTHER	XXXX	XXXX	XXXX
TOTAL	XXXX	XXXX	XXXX

Figure 43. Patron Statistical Report

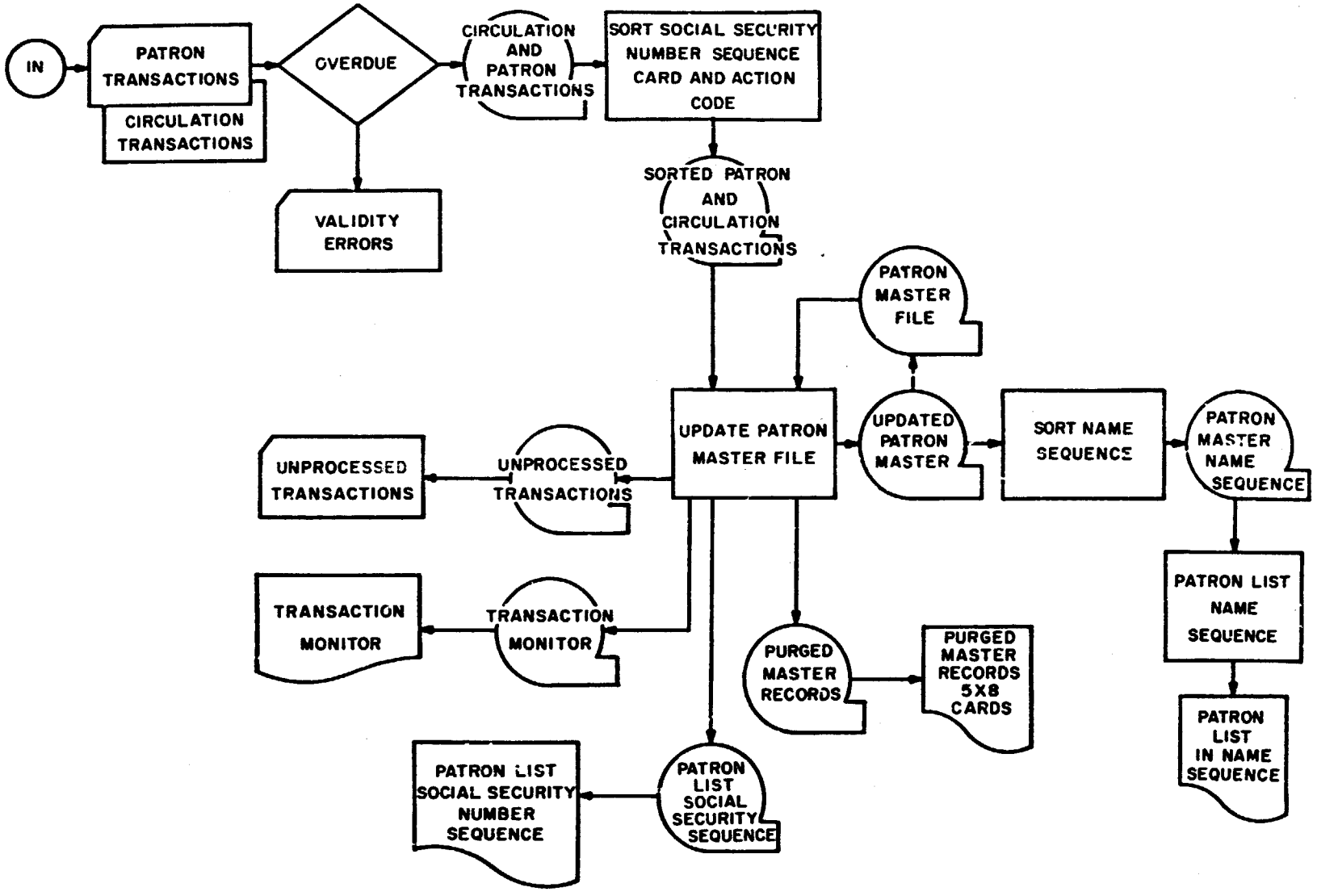

Figure 44. Large Scale Circulation Control System

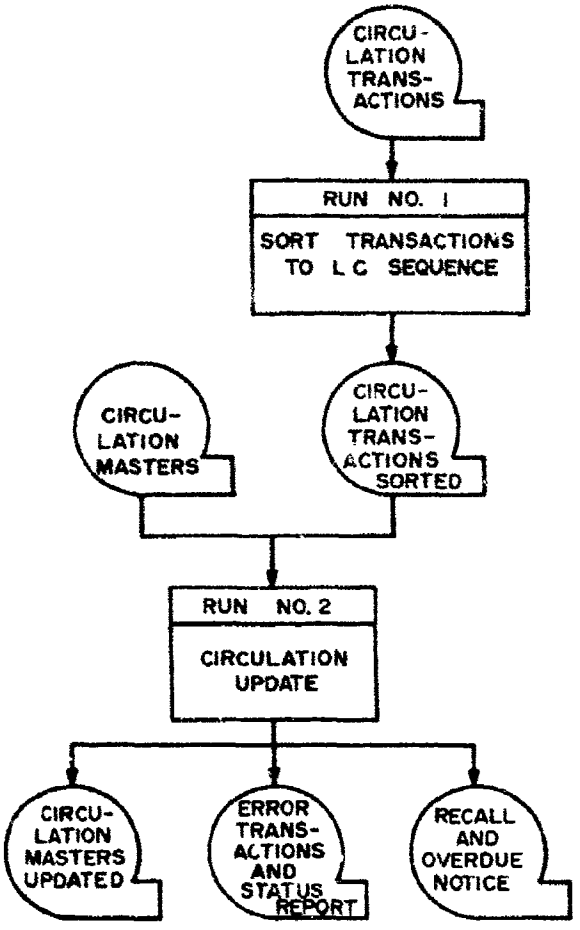

Figure 45. Systems Chart, Runs 1 and 2

01 JAN 64 PATRON STATISTICAL REPORT PAGE 1 of 1

(a) THERE WERE XX, XXX PATRONS IN FILE AS OF 01 DEC 63. SINCE THAT TIME THE FOLLOWING ACTIONS HAVE TRANSPIRED -

(b) XXXX PATRONS ADDED
(c) XXXX PATRONS DELETED
(d) XXXX PATRON RECORDS CHANGED
(e) XXXX UNPROCESSED TRANSACTIONS
(f) XXXX TOTAL TRANSACTIONS

(g) THERE ARE NOW XX, XXX PATRONS IN FILE AS OF 01 JAN 64. THEIR VARIOUS STATUSES ARE SHOWN IN THE STATISTICAL BREAKOUT BELOW

PATRON TYPE	TOTAL PER TYPE	WITH CLEARANCES	WITHOUT CLEARANCES
ARMY	XXXX	XXXX	XXXX
NASA	XXXX	XXXX	XXXX
MILITARY	XXXX	XXXX	XXXX
CONTRACTOR	XXXX	XXXX	XXXX
OTHER	XXXX	XXXX	XXXX
TOTAL	XXXX	XXXX	XXXX

Figure 43. Patron Statistical Report

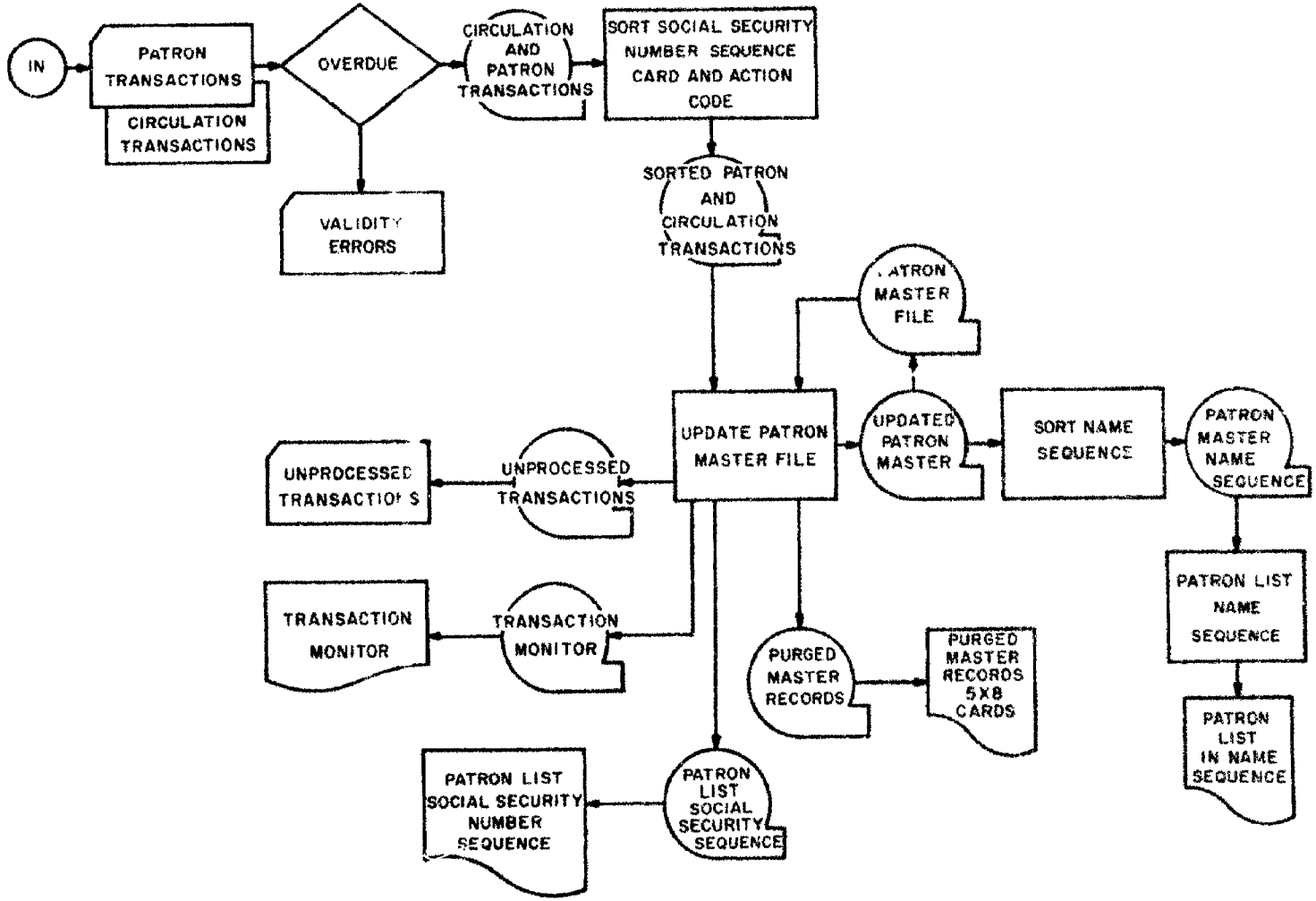

Figure 44. Large Scale Circulation Control System

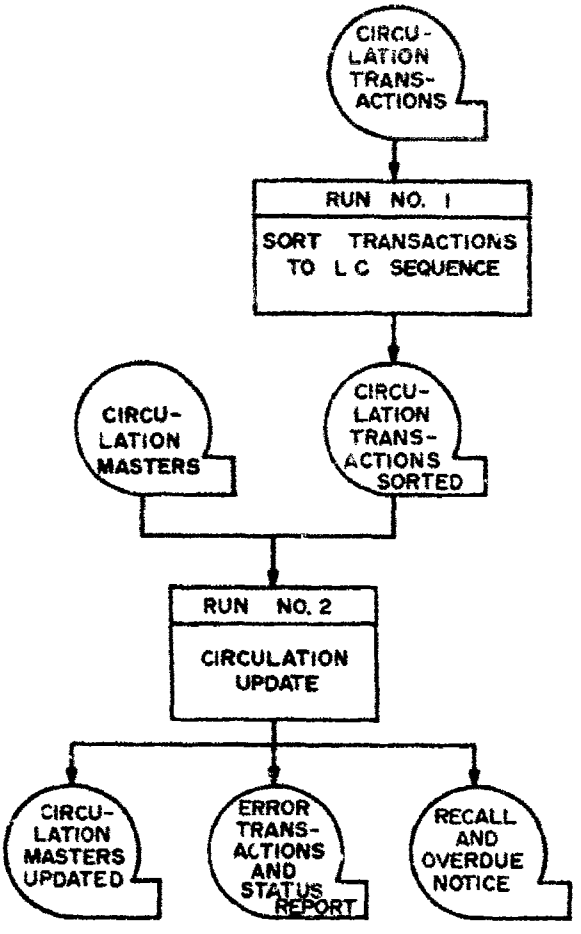

Figure 45. Systems Chart, Runs 1 and 2

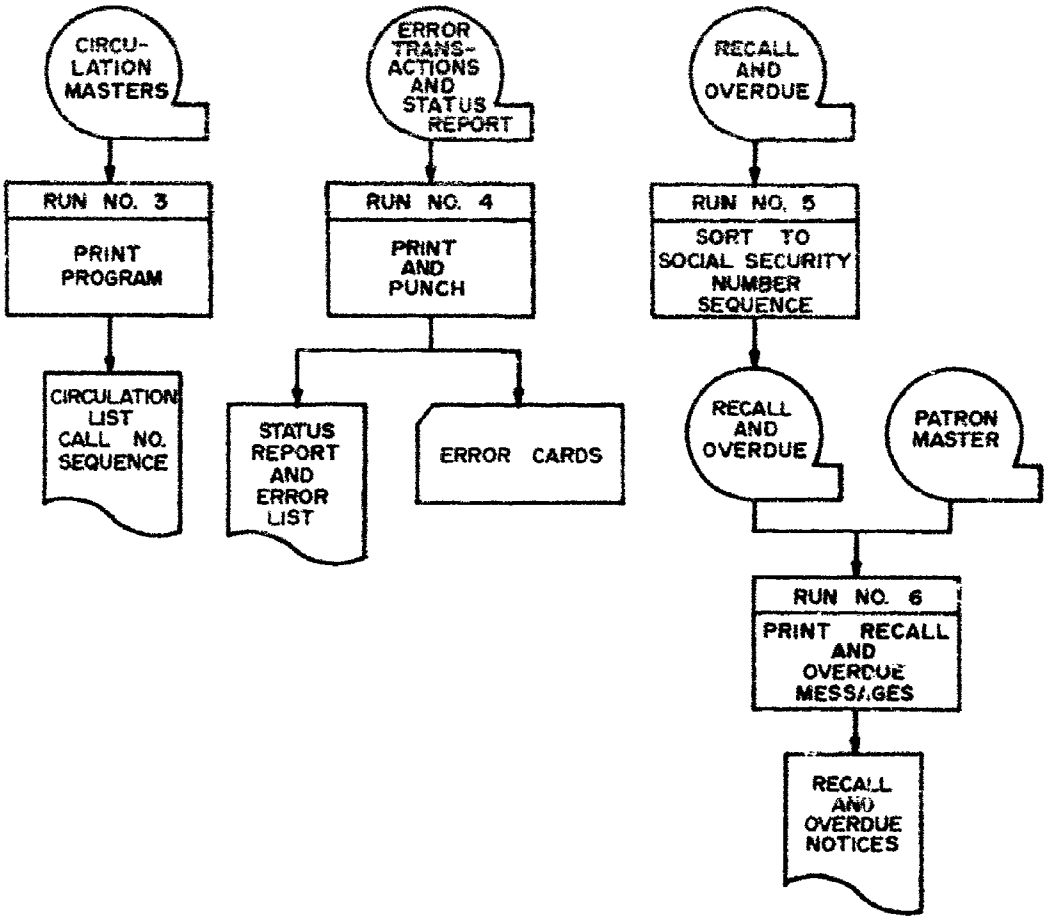

Figure 46. Systems Chart, Runs 3, 4, 5, and 6

RSIC CIRCULATION STATISTICAL REPORT DA MON YR

	Beginning	During	End
LOANS	xxxxx	xxx	xxxxx
REGULAR LOANS	xxxx	xx	xxxx
LONG TERM LOANS	xx	x	xx
BRANCH LIBRARY LOANS	xxx	xx	xxx
INTERLIBRARY LOANS	x	x	x
RETURNS		xxxx	
RECALL NOTICES OR POSTINGS	xxxxx	xxx	xxxxx
PATRON RECALLS	xxx	xx	xxx
OVERDUE NOTICES	xx	xx	xxxx
2ND NOTICE	x	xx	xxx
REPROCESSING RECALLS	xxxx	xx	xxxx
2ND NOTICE	xx	x	xx
LONG TERM REVIEW ACTIONS	xx	x	xx
2ND NOTICE	x	x	x
RSIC ACTION NOTICE LIST	xxx	xx	xxx
ITEMS LOST	xxx	xx	xxx
ITEMS FOUND	xx	x	xx
TOTAL TRANSACTIONS		xxxxx	

A SUMMARY OF THE DAILY ACTIONS, IN THE SAME FORMAT AS THE ABOVE REPORT, WILL BE PRODUCED WEEKLY AND MONTHLY.

The last run for any given month must check on the date field of the transaction being processed and accumulate totals for those transactions affecting last month's totals as well as this month's totals.

Figure 47. RSIC Circulation Statistical Report

RSIC CIRCULATION LISTING IN CALL NUMBER SEQUENCE DA MON YR PAGE xxxxx

CALL NUMBER	AUTHOR/TITLE PATRON NAME	COPY	SOCIAL SEC	CODES	DATE LOAN	PHONE NR	MAIL SYMBOL
PE 1591 L675 1961	LEWIS ROGETS THESAURUS						
L	TUCKER, F.	5	[illegible]-24-2788	1 0 1	29 Apr 63	876-xxxx	MSFC-PVE-GE
REK1	FREDERICK, P. W., DR.	6	422-18-7473	1 0 1	3 May 63	876-xxxx	MSFC-PVE
REP RER1	KNOWLES, H. C.	10X	530-43-2947	1 0 1	1 Jan 64	876-xxxx	R-AST-E
PE 1628 T499 1958	THORNDIKE BARNHART COMP DICT						
	ACKERSON, F. E.	110	444-44-4444	1 0 1	4 Dec 64	876-xxxx	MSFC-P&E
	BAILEY, B. B.	221		1 0 1	5 Jan 65		NP

The following codes will be printed whenever these conditions exist:

L	If book is flagged as "Lost".
REP	If book has been recalled for a patron.
RER	If first notice has been sent for a book that is needed for reclassification.
RER2	If second notice has been sent for a book that is needed for reclassification.
RER3	If book appears on RSIC action list.
ODR	If a regular loan is now overdue.
ODR2	If a second notice has been sent on a regular loan that is overdue.
ODR3	If the regular loan is overdue and appears on the RSIC action listing.
ODL	If loan is a long term overdue.
ODL2	If a second notice has been sent on a long term overdue.
ODL3	If the long term overdue appears on the RSIC action listing.
RIL	If the book appears on the Interlibrary Loan Listing.

NOTE: PRINT THE CALL NUMBER AND AUTHOR AND TITLE AS THE FIRST LINE OF EACH PAGE.

Figure 48. RSIC Circulation Listing in Call Number Sequence

RSIC CIRCULATION LISTING IN PATRON NAME SEQUENCE DA MON YR PAGE xxxxxx

PATRON NAME / AUTHOR/TITLE	SOCIAL SECURITY NO.	PHONE NO.	MAIL SYMBOL / CALL NUMBER	BLDG.	COPY CODES	DATE LOAN
ABATE, D.K.	111-11-1111	876-xxxx	MS-BQ-E 4484			
GIBSON CONTROL SYST COMP			TK 7870 G449 1958		2X 1 0 1	24 AUG 64
RADIO AMAT HDBK			TK 6550 R129 1963V1S12		4X 1 0 1	18 APR 64 REP
PIERUSCHKA PRINC OF RELI			TA 168 P624 1965		8 1 0 1	4 DEC 65 ODR2
ABERNATHY, M. T.	222-22-2222	876-xxxx				
GIBSON IPC HOW TO DES & SPEC PR			621.3817 G 37953		1 1 0 1	JAN 61
CURRAN SCREEN WRITING			791.4 C 40266		1 1 0 1	FEB 62

The following codes will be printed whenever these conditions exist on the right side of the page.

L	If book is flagged as "Lost".
REP	If book has been recalled for a patron.
RER	If first notice has been sent for a book that is needed for reclassification.
RER2	If second notice has been sent for a book that is needed for reclassification.
RER3	If book appears on RSIC action listing.
ODR	If a regular loan is now overdue.
ODR2	If a second notice has been sent on a regular loan that is overdue.
ODR3	If the regular loan is overdue and appears on the RSIC action listing.
ODL	If loan is a long term overdue.
ODL2	If a second notice has been sent on a long term overdue.
ODL3	If the long term overdue appears on the RSIC action listing.
RIL	If the book appears on the Interlibrary Loan Listing.

NOTE: PRINT THE PATRON INFORMATION ON THE FIRST LINE OF EACH PAGE, WITH THE WORD CONTINUED IF THE DATA FOR ANY GIVEN PATRON OVERFLOWS TO THE NEXT PAGE.

Figure 49. RSIC Circulation Listing in Patron Name Sequence

CIRCULATION UPDATE ERROR LIST DA MON YR PAGE xxxxxx

1 2.....10.....20.....30.....40.....50.....60.....70...

NO * AFTER CALL NUMBER K. O.†	J CARD IMAGE OF THE ORIGINAL TRANSACTION
DATE FIELD TOO LONG K. O.†	2 CARD IMAGE OF THE ORIGINAL TRANSACTION
MAIN CLASS TOO LONG K. O.†	1 CARD IMAGE OF THE ORIGINAL TRANSACTION
DATE NOT IN RANGE 1790-1965 K. O.†	1 CARD IMAGE OF THE ORIGINAL TRANSACTION
COPY NO FIELD NOT PRESENT K. O.†	J CARD IMAGE OF THE ORIGINAL TRANSACTION
CUTTER STARTS WITH NUMERIC K. O.†.	1 CARD IMAGE OF THE ORIGINAL TRANSACTION

(LISTING WILL BE IN SOCIAL SECURITY NUMBER SEQUENCE)

NOTE: ERROR CARDS WILL ACCOMPANY THE LISTING, MINUS THE ACTION CODES. THEY WILL BE INTERPRETED 80-80.

†KICKOUT.

Figure 50. Circulation Update Error Listing

RSIC CIRCULATION/INVENTORY UPDATE ERROR INDEX DA MON YR

Error Code	Meaning	Action Code	Decoded
ERROR 1	Trying to loan a book already on loan.	1	1
ERROR 2	Trying to loan a book recorded as lost.	1	1
ERROR 3	Recall of book not on loan.	2	2
ERROR 4	Recall of book recorded as lost.	2	2
ERROR 5	Trying to record lost book already recorded as lost.	Zero	Zero
ERROR 6	Return of book not recorded as loaned.	J	11 and 1
ERROR 7	Found book action on book not shown as lost.	Ō	11 and 0
ERROR 8	Call number does not match a call number on the circulation file.	A	12 and 1

Figure 51. RSIC Circulation/Inventory Update Error Index

TO	PATRON NAME AND INITIALS	SOCIAL SECURITY NO.	DA MON YR
	STREET/OFFICE SYMBOL	PHONE	XXX XXXX
	CITY/BUILDING	DATE OF LOAN	DA MON YR

XXX OVERDUE EXTENDED LOAN

Fold . . . . . .

FROM LIBRARY BRANCH, RSIC
BUILDING 4484, AMSMI-RBLS
REDSTONE ARSENAL, ALABAMA
PHONE 876-5195

THE BOOK LISTED BELOW HAS BEEN ON EXTENDED LOAN TO YOU FOR MORE THAN A YEAR. IF YOU NO LONGER NEED IT, RETURN IT WITH THESE CARDS TO THE ABOVE ADDRESS. IF IT IS STILL NEEDED, SIGN AND RETURN THE ENCLOSED RENEWL REQUEST CARD, BUT DO NOT RETURN THE BOOK.

CALL NUMBER
AUTHOR/TITLE

Figure 52. Overdue Extended Loan Notice

Fold

TO	PATRON NAME AND INITIALS	SOCIAL SECURITY NO.	DA MON YR
	STREET/OFFICE SYMBOL	PHONE	xxx xxxx
	CITY/BUILDING	DATE OF LOAN	DA MON YR

RECALL FOR REPROCESSING xxx NOTICE

.. .. .. Fold

FROM LIBRARY BRANCH, RSIC
BUILDING 4484, AMSMI-RBLS
REDSTONE ARSENAL, ALABAMA
PHONE 876-5195

THE BOOK LISTED BELOW IS BEING RECALLED FOR REPROCESSING. PLEASE RETURN IT TO THE ABOVE ADDRESS WITH THIS NOTICE TO SPEED HANDLING IN THE LIBRARY. IF YOU WISH THE BOOK RETURNED TO YOU AFTER REPROCESSING, PLEASE CHECK HERE ..... .

CALL NUMBER....
AUTHOR/TITLE...

Figure 53. Recall for Reprocessing Notice

TO	PATRON NAME AND INITIALS	SOCIAL SECURITY NO.	DA MON YR
	STREET/OFFICE SYMBOL	PHONE	xxx xxxx
	CITY/BUILDING	DATE OF LOAN	DA MON YR

OVERDUE xxx NOTICE

Fold . . . . Fold

FROM LIBRARY BRANCH, RSIC
BUILDING 4484, AMSMI-RBLS
REDSTONE ARSENAL, ALABAMA
PHONE 876-5195

THE BOOK LISTED BELOW IS NOW OVERDUE. PLEASE RETURN IT TO THE LIBRARY. IF YOU ARE AN AMICOM OR MSFC EMPLOYEE AND NEED IT ON EXTENDED LOAN (MICOM R 705-7, MSFC R 25-8), PLEASE SO INDICATE AND THE BOOK WILL BE RETURNED TO YOU, IF POSSIBLE.

CALL NUMBER....
AUTHOR/TITLE...

Figure 54. Overdue Notice

Fold

TO PATRON NAME AND INITIALS
STREET/OFFICE SYMBOL
CITY/BUILDING

SOCIAL SECURITY NO.
PHONE
DATE OF LOAN

DA MON YR
xxx xxxx
DA MON YR

PATRON RECALL REQUEST

Fold

FROM LIBRARY BRANCH, RSIC
BUILDING 4484, AMSMI-RBLS
REDSTONE ARSENAL, ALABAMA
PHONE 876-5195

THE BOOK LISTED BELOW IS NEEDED FOR LOAN TO ANOTHER PATRON. IF NO LONGER REQUIRED, PLEASE RETURN IT TO THE ABOVE ADDRESS IN PERSON OR BY MAIL ALONG WITH THIS NOTICE.

CALL NUMBER...
AUTHOR/TITLE...

Figure 55. Patron Recall Request

RSIC ACTION LISTING DA MON YR PAGE xx.

TO RSIC
BUILDING 4484, AMSMI-RBLS
REDSTONE ARSENAL, ALABAMA

BOOKS LISTED BELOW HAVE EXCEEDED THE NORMAL LOAN AND 2ND NOTICE PERIOD.

CALL NUMBER
AUTHOR/TITLE
PATRON NAME PHONE NUMBER LOAN DATE 2ND DATE

CALL NUMBER
AUTHOR/TITLE
PATRON NAME PHONE NUMBER LOAN DATE 2ND DATE

CALL NUMBER
AUTHOR/TITLE
PATRON NAME PHONE NUMBER LOAN DATE 2ND DATE

LOAN DATE - Print the date of the original loan
2ND DATE - Print the date that the 2nd notice was prepared.

Figure 56. RSIC Action Listing

Section VI. ON-LINE CONTROL SYSTEM

1. On-Line Circulation Control System

The on-line circulation control system is the latest concept of controlling patron data and circulation of library material. Input to this system is identical to the data discussed in the previous circulation control systems.

This system is operated by means of storing data on random access equipment, which is located in a place other than the library and is shared by other users. Access to the equipment is provided through the use of remote terminals which are located within the library branch. These remote terminals provide the means of establishing data on the random access equipment and of making queries on data with the ability to control patron records and provide the means of circulating library material.

The on-line system has many features which make it practical and advantageous over the other systems discussed. Some of the advantages are as follows:

1) Immediate access to data through remote processing terminal.
2) Ability to control processing from the source of data generation.
3) Ability to use a very expensive system at reasonable prices through sharing of computer time, thereby reducing overhead expenses.
4) Elimination of error lists and voluminous reports such as listings of entire patron file in name sequence and social security number sequence, listings of circulation files in patron name sequence and LC call number sequence.
5) Ability to locate patron data through the use of social security number or patron name. A near-match algorithm is used to assist in locating a patron record when the exact spelling is not used.
6) Editing of input data and error detection, which allows for immediate correction procedures which prevent erroneous data to be stored.

The purpose and use of the on-line patron control system are discussed in Paragraph 2. The purpose of the on-line circulation control system is discussed in Paragraph 3.

2. On-Line Patron Control System Operational Procedures

The on-line patron control circulation system consists of a patron master file, which is made up of individual patron records (Figure 57). Access to this file is by means of the patron social security number or patron name. If the patron's name is used, a near-match algorithm is used to assist the user in locating a patron record, when the exact name spelling is not used.

a. Inputs

The patron master file is established and maintained by processing transactions of the following three types (Figure 58):

1) 01 Add Patron - Establish patrons on file. The minimum data required are:

   a) Social security number.
   b) Surname.
   c) Given name.
   d) Type of patron.
   e) Security code.
   f) Citizenship.
   g) Mailing address.

2) 02 Change Patron Data - This transaction adds, changes, and deletes specific data elements within the patron record.
3) 02 Delete Patron Record - This transaction is used in the same manner as the change. The identification of a delete is the complete absence of data elements except the social security number and surname (see reverse side for insert).

Processing of the above transactions is accomplished by the association of data element codes with data in the transaction record. Special characters are also used to separate data elements within the transaction. An end data record character is used to indicate the end of data record.

The purpose and use of the indicators are as follows:

1) Data element codes are three position codes used to determine the data elements in the transaction to be processed.
2) A special character after the data indicates the end of data to

be processed, and this special character immediately after a data element code indicates a delete of the associated data in the patron record where single data fields exist.

3) A special character at the end of all data elements indicates the end of a record, and this special character immediately after a central field indicates a purge of the complete record.
4) A special character preceding the end data indicator code denotes a delete of the matching data in the patron record when multiple data fields exist for a data element code.
5) A citizenship table is provided for identification of patron citizenship (Figure 8).
6) A logic chart is provided to show the general logic of an on-line patron control system (Figure 59).

b. Outputs

All outputs of this subsystem are prepared on continuous form 8-inch-wide stock, which normally will be 5- by 8-inch perforated cards.

The following outputs are generated:

1) Purged patron record (Figure 60).
2) Unprocessed data with error messages attached indicating possible corrective action to be taken.
3) Patron financial and statistical record (Figure 61).
4) Message indicating transaction processing complete.
5) End-of-month statistical data. (The end-of-month statistical data should be retrieved by a program other than the patron file maintenance program.)

Transaction editing criteria are as follows:

Data Elements	No. Digits	Edit Criteria	Error Message
Transaction 01 and 02			
Social security number	09	Must be numeric	ER01 INVALID SSN
Transaction code	02	Must be 01 or 02	ER02 INVALID TX

Data Elements	No. Digits	Edit Criteria	Error Message
Transaction 01 and 02			
Surname	1-16	Initial character must be ALPHA. All characters must be ALPHA, dashes, or blanks.	ER03 INVALID SURNAME
Transaction 01			
Given name	1-18	First character must be alphabetic. All nonblank characters must be alphabetic, periods, or dashes.	ER04 INVALID GIVEN NAME
Patron type	01	Must be A, C, N, N, or O	ER05 INVALID TYPE CODE
Security code	01	Must be U, C, S, or T	ER06 INVALID CLEARANCE
Citizenship	02	Must be numeric	ER07 INVALID CITIZENSHIP
Telephone number	07	Must be numeric or blank	ER08 INVALID PHONE NR.
Extension number	03	Must be numeric or blank	ER09 INVALID EXT. NR.
Contractor code	04	Must be numeric if type patron is C. Must be blank if type patron is not C.	ER10 INVALID CONTRACTOR
Transaction must contain minimum mandatory data		Social security number, surname, given name, type of patron, security code, citizenship, mailing symbol or street, city and state must be present.	ER11 MIN DATA NOT PRESENT

Data Elements	No. Digits	Edit Criteria	Error Message
Transaction 02 Change Patron			
		Changes cannot be processed for type of patron or contractor code. These actions require a complete delete-and-add transaction. Changes to social security number and surname will require the old social security number and surname to appear in the control field of the transaction record and new data will appear in the data field. All other data are edited the same as a transaction 01.	ER16 INVALID CHANGE ON PATRON TYPE ER17 INVALID CHANGE ON CONTRACTOR CODE
Transaction 02 Delete Patron			
		The delete patron transaction must contain the transaction code 02, social security number, and patron surname followed by end of data element indicator and end of record indicator.	ER18 INVALID DELETE

The update editing criteria and processing actions are as follows:

Transaction	Edit Check	Error Message and Action	Action if Valid Transaction
01 Add Patron	Must not match patron master record on social security number.	ER12 Patron already on file. Display mandatory elements of patron on file. See Subparagraph a. 1).	Establish new patron record and update statistical file. Display message: Patron added to file.
	If match occurs and delete flag is present, then transaction is reinstate of patron to active status and must match on surname.	ER13 Error in Surname. Display mandatory elements of patron on file. See Subparagraph a. 1).	If action is reinstate of patron record on inactive status, blank out data in master record not appearing in transaction record. Display message: Reinstatement to active status.

Transaction	Edit Check	Error Message and Action	Action if Valid Transaction
02 Change	Must match patron on social security number.	ER14 SSN not on file. Attach error message to transaction and display.	Replace or blank out corresponding data elements in the patron master record.
	Must match patron.	ER15 Surname does not match patron record on SSN. Display mandatory elements of patron file.	Display message. Patron data changed. Also display elements changed.
02 Delete	Must match patron record on social security number.	ER19 Invalid delete SSN not on file. Attach error message to transaction and mandatory data of patron in file and display.	Place indicator flag on patron status, send reply. Patron changed to inactive status.

c. Purged Master Record

This record (Figure 60) will be constructed for every patron deleted from the patron master file. The following information will be shown:

1) Line a. This line will show the social security number, patron name, title, type patron, security clearance, and citizenship. The data will be the same as shown in the patron record except that dashes are inserted in the social security number.
2) Line b. This line will show the organization location and phone number.
3) Line c. This line will show the patron address.
4) Line d. This line will show any additional comments that may be required.

3. On-Line Book Circulation Control Subsystem

a. Purpose

The book circulation control system maintains the segment of the books master file pertaining to the status of all books in the library.

b. Operation Principles

The books master file (Figure 62) is designed to accommodate all the data required for book circulation control. The book circulation control system provides immediate control and maintenance of all the open literature items pertaining to location and status. Data are maintained in the record for each individual copy number. Circulation, renewals, recalls, lost and found items, and overdues[1] are processed. The book circulation control system posts data to the statistical master file - books records and to the patron master file.

c. Transactions

Input to the books master file is entered from on-line remote terminal transactions. The following actions are processed against the file:

Function	Code
1. Establish master record	28
2. Circulate	29
3. Return	30
4. Recall	31
5. Renew	32
6. Lost	33
7. Found	34

d. General Processing Requirements

The major control of the books master file is an identification number. The system is programmed with provisions for LC

[1] In on-line real time processing, large files cannot be scanned and still insure reasonable turnaround times. Therefore, this system will have a "close of business" routine that will, among other things, scan the books master file for overdues and produce overdue notices for mailing.

call numbers for identification or control numbers.[2] All transactions in the book circulation control subsystem must contain this control number and the copy number to locate the matching record in the master file. The existing status is checked to assure the transpiring transaction is a logical sequence of operations. If not, a message is sent to the transaction originator calling attention to the fact. After double-checking and assuring the action in process is correct, this transaction will supersede, without any further considerations, the existing status.

Transaction formats (Figures 63 and 64) consist of variable and fixed length fields. The major control is identification (call number), and the secondary control is copy number. The data within the transaction is identified by data element codes, transaction code, end data indicator codes, and an end data record code.

The purpose and use of the indicators are explained in the patron control system. Transaction code 28 establishes a master record on the circulation file. The data required to establish the master record are taken from the book circulation card. The book call number is edited and matched against the book master file; if the number is not on file, a circulation master record is produced and placed on random access storages. If the call number matches the file, a message (call number already on file) is appended to the transaction and relayed to the remote terminal and processing terminated.

Transaction code 29 circulates an item. The transaction code, patron social security number, and type loan are entered through an on-line remote keyboard. The book call number is entered from the book circulation card from an on-line remote card reader.[3] If the patron social security number is not available when entering the transaction, the patron name and initials may be entered and used to locate the social security number in the patron file. A near-match algorithm is used in this search process. If more than one name and social security number are displayed on a near match and one of the items displayed is determined manually to be correct, the item number of the correct social security number is entered to continue the "check out an item" transaction. If no match is possible by using the algorithm, a message is transmitted to the remote terminal stating that the patron is not on file. If a match is made, the patron social security number, type loan, and book call number entered will cause the patron record to be located

[2] Reference "General Description" documentation for explanation.

[3] This configuration is not necessarily the ideal hardware for a remote station to perform this function. However, to utilize the standard formats, card in and out and typewriter keyboard are specified.

and transferred to memory. The date of last action is checked in the patron record. If no action has been processed against the patron record for six months, the following information is displayed for verification: 1) phone number, 2) extension, 3) mail symbol, 4) building number, 5) room number, 6) street, and 7) type patron. These data are then verified and if type of patron or contractor have changed, a transaction code 02, which will cause the computer to generate a delete transaction, must be entered. No further action can be processed on this patron until he is reestablished as a valid patron.

If the patron security code, citizenship, or mailing symbol have changed, a transaction code 02 is entered along with the data element codes and data that have changed. This will cause the computer to process a change transaction which will call in the patron module and produce a revalidation notice.

Other patron changes required after displaying the patron data will be changed by entering the transaction code 02 and the data element code with the new data. The program processes a change transaction to the patron file and updates the patron record prior to continuing the book loan action. (It must be noted that each time the patron control subsystem is brought into memory, the original book loan transaction must be saved for processing after the patron record has been changed.) When control has been returned to the books circulation control subsystem, the patron record is checked for any overdue notice flags. If there are any overdue notice flags, a message is displayed as follows: "SSN XXX-XX-XXXX has YY overdue items." The operator has the option to display the overdue items and dates if required. If the action is not terminated at this point, the comments field will be scanned for a display flag. Any comment containing a display flag will be displayed to the remote station for determination of the effects of the comments on the book transaction before continuing processing. If processing is to continue, the program matches the call number to the books master file. If no match occurs, a message is transmitted to the remote station as follows: "Call Number not on file." If the call number is located on the file, thebooks master file is checked to determine the present status of the book. If the status is something other than on the shelf, a message is sent to the remote station stating the indicated status. A new book circulation card is generated at the terminal for the book to be loaned. Thebooks master file, statistical master file - book records, and the patron master file are updated and the processing terminated.

When a book is returned to the library, transaction code 30, "Return an Item," is used. The circulation card for the item is read through the card reader. The program will verify the card for valid

patron surname and social security number. The books master file is checked to determine if the book being returned is posted as "on loan." The book record is updated, at which time the recall element code is checked to see if the book has been recalled for another patron. When the item is on recall for a patron, an automatic circulation transaction is generated. The patron record and statistical files are updated, and processing is terminated for a return transaction.

To recall an item for loan to another patron (Figure 65), the transaction code 31 is used. The call number without the copy number used in the transaction along with the requesting patron social security number will cause recall of all available items and automatic checkout of the first item returned. If the copy number is specified, only that single copy is recalled. A notice is prepared notifying the requester that action has been taken to fulfill his request when a recall transaction is processed. Multiple patron recalls of the item are provided in this subsystem.

For recalling items for reprocessing (Figure 66), the transaction code 31 is also used, but in place of the requesting patron social security number, the term "Reprocess" is used. Upon return of the recalled item, the message "Send to Reprocess" is displayed.

For a renewal of an item already on loan (Figure 66), a transaction is entered in the same manner as a return transaction except that it is a transaction code 32, "Renew an Item," and the book data may be entered from the keyboard or the book card.

To post a copy of an item as lost (Figure 67), the transaction code 33 is used. The call number and copy number are entered, and the status code is posted as "Lost."

To change the status of an item that has been posted as lost and is now reported as in the possession of the patron who reported it as lost (Figure 67), a "Found" transaction code 34 is used. This will cause the item to be posted as circulated to the patron reporting the item as found on a regular loan basis. Items that are found in the library, or turn up for any other type action, that are posted as lost are updated to the actual existing status at the time they are handled.

e. Editing Criteria

(1) Preparation of the Circulation Card. Initial preparation of the circulation card will be accomplished as tabulated below:

Card Column	Description	Remarks
1	Blank[4]	
2-50	Call number and authors and title. Punch call number followed by an asterisk and use balance of columns (through 50) for author and title information.[5] The call number format shown in Figure 68 should be followed.	
51	Security classification[6,7]	See tabulated data on page 147
52	Status of book[5]	See tabulated data on page 149
53	Current year[7]	Last digit of year
54-56	Today's date[7]	Julian form (182nd day of the year)
57 65	Patron social security number[5]	Nine numeric digits. No blanks or dashes permitted
67-78	Patron last name[5]	No spaces allowed in the surname
79-80	Patron initials[7]	

(2) Punching Instructions for an LC Call Number

(a) Field 1 of Figure 68 — This field, which is always alphabetic, may be composed of one or two alphabetic characters and may or may not be followed by one blank.

(b) Field 2 of Figure 68 — This field must always be all numeric and must not exceed four characters. If there is no Field 3, Field 2 is followed by a blank.

[4] Column 1 is left blank to assure compatibility with other standard systems that are not on-line applications.

[5] Fields or data entered from the keyboard in the transaction.

[6] Open literature circulation will never have a security classification other than unclassified. This format is standardized to include other items that may have various degrees of security classification.

[7] Fields or data generated from the program.

(c) Field 3 of Figure 68 – This field, if it exists in the LC number, is always separated from Field 2 by a decimal point (period) and cannot exceed seven characters.

(d) Field 4 of Figure 68 – This field must always begin with an alphabetic character followed by no more than three numbers. Field 4 is always followed by a blank.

(e) Field 5 of Figure 68 – This field must contain four numeric numbers (date) or four numeric numbers followed by a dash (-) and two numeric numbers or in the case of no date, ND.

(f) Field 6 of Figure 68 – This field represents the balance of the LC number and is continued until completion of the LC number. The last alphabetic character in the string must be a C or X. If X is the last character denoting the book as an expendable item, it must be preceded by a C denoting the copy number of the book. The last numeric characters in the string following the C must not be greater than 300. The last character of the string is always followed by an asterisk.

Tabulated below are the security code conversion data:

Document Classification	Displayed	Meaning
0	U	Unclassified
1	OUO	Official use only
2	S	Secret
3	TS	Top Secret
4	C	Confidential
5	CMH	Confidential-modified handling
6	CRD	Confidential-restricted data
7	SRD	Secret-restricted data

Tabulated below are the book circulation subsystem display messages:

Message Number	Message	Remarks
23	Attempting to Circulate an Item Posted as On Loan to (Social Security Number) (Patron's Name)	This message will be displayed any time an item is being processed for circulation and status element (B19) indicates item is already on loan.

Message Number	Message	Remarks
24	Attempting to Circulate an Item Posted as Lost by (Social Security Number) (Patron's Name)	Message will be displayed any time an item is being processed for circulation and that status element (B19) indicates item is lost.
25	Attempting to Renew Item Not on Loan	Message will be displayed any time an item is being processed for renewal and that status indicates item is posted as lost.
26	Attempting to Renew Item Posted as Lost by (Social Security Number) (Patron's Name)	Message will be displayed any time an item is being processed for renewal and that status indicates item is posted as lost.
27	Attempting to Post Lost Book Already Recorded as Lost	Display message and terminate processing.
28	Return of Book Not on Loan or Lost	Display message and update files.
29	Call Number Not on File	Displayed when item cannot be located in the file.
30	Send to Reprocess	Displayed when item is returned that has been recalled for reprocessing.
31	Social Security Number XX Has YY Overdue Items	Displayed on circulation transactions when applicable.

Tabulated below are the input transaction, hard copy output, and status code data:

INPUT TRANSACTIONS

Transaction Codes	Action	Format
28	Establish master record	Figure 62
29	Circulate an item	Figure 63
30	Return an item	Figure 63
31	Recall an item	Figure 63
32	Renew an item	Figure 64
33	Flag an item lost	Figure 64
34	Flag an item found	Figure 64

HARD COPY OUTPUTS

Book circulation card	See page 147
Recall for reprocessing notice	Figure 69
Patron recall request	Figure 70
Action notification	Figure 71

STATUS CODES

Code	Description
1	Regular 180-day loan
2	Interlibrary loan
8	Book loan requiring issue slip
9	Long term loan
C	In cataloging
L	Lost
D	Surplus
E	On order
F	On shelf
G	Bindery

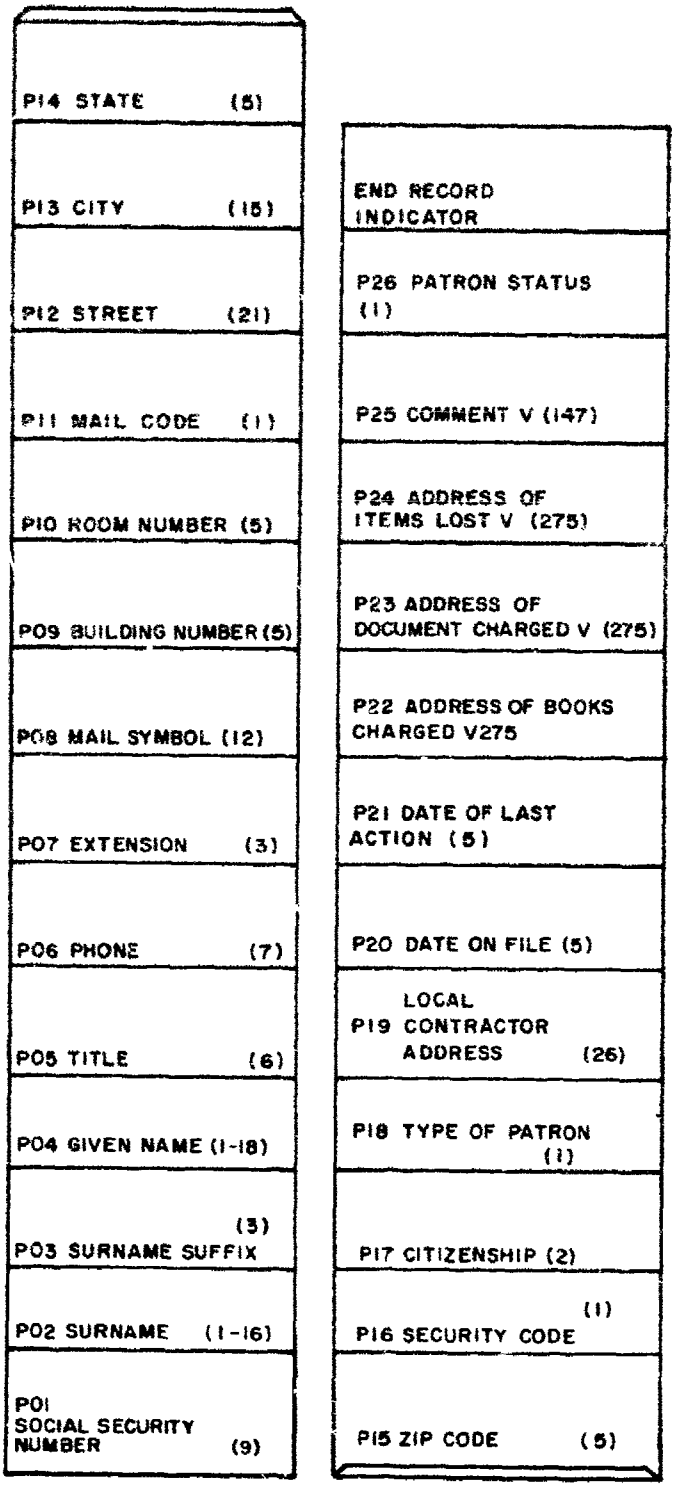

Figure 57. Patron Master File

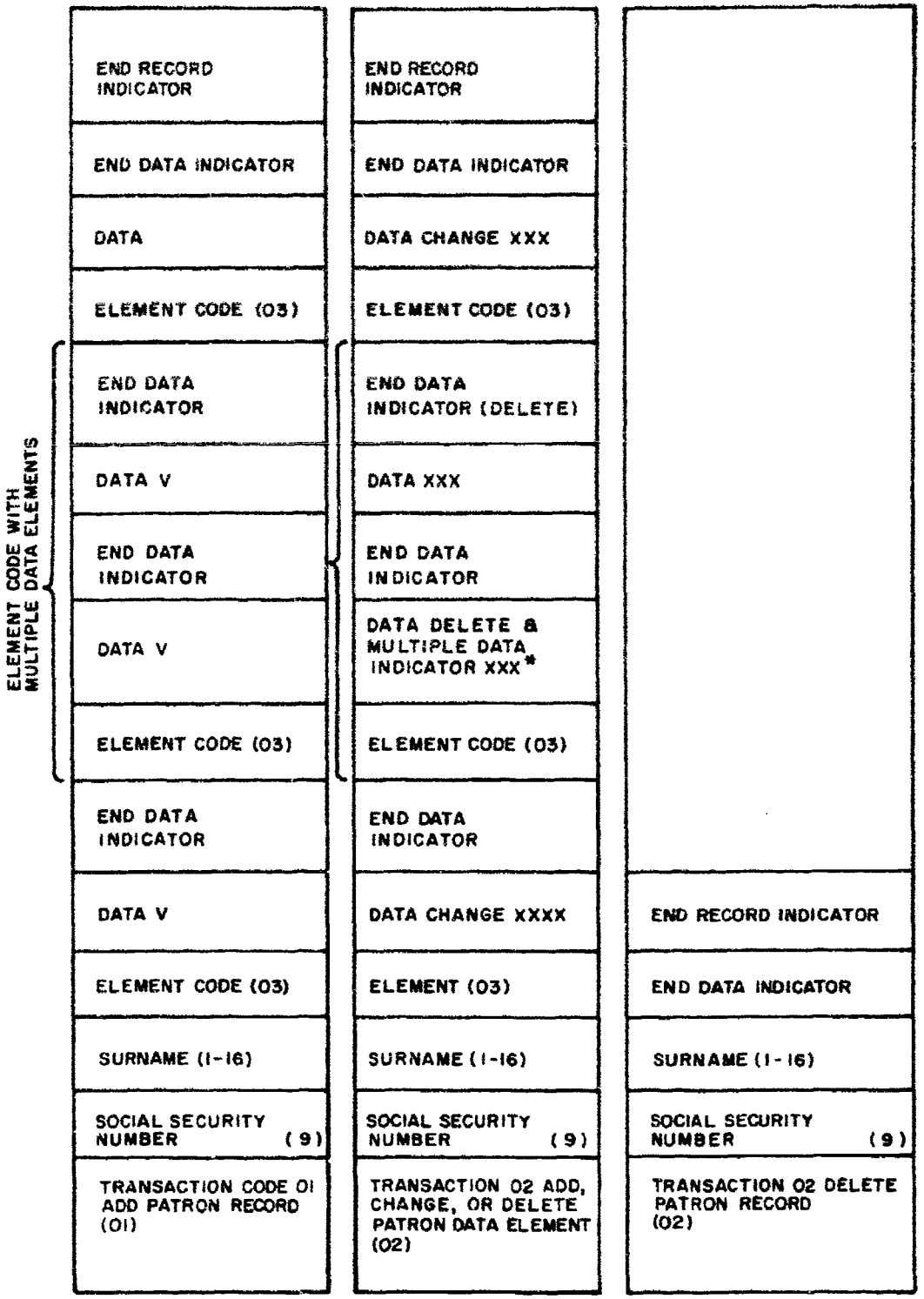

Figure 58. Transaction Form

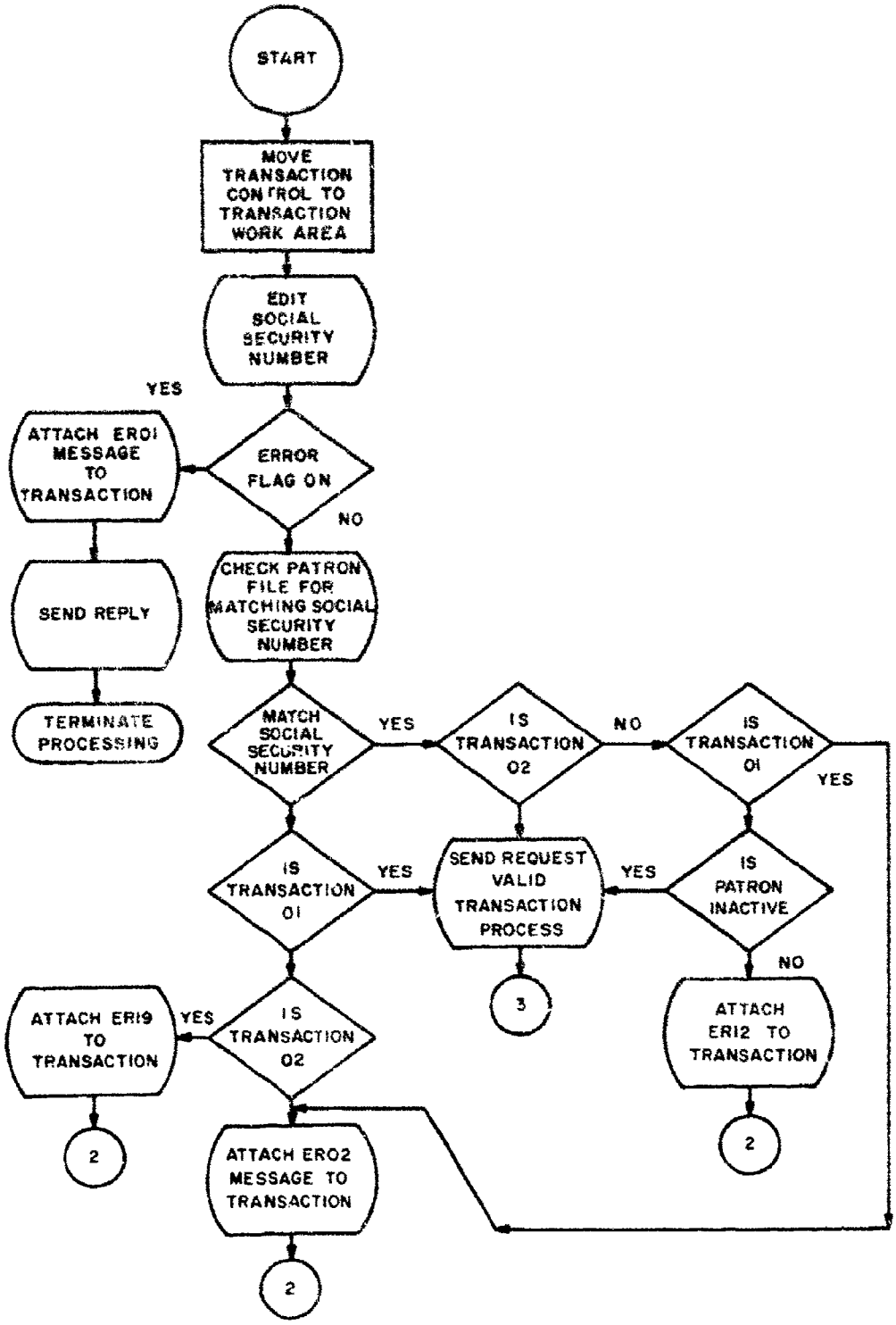

Figure 59. Logic Chart

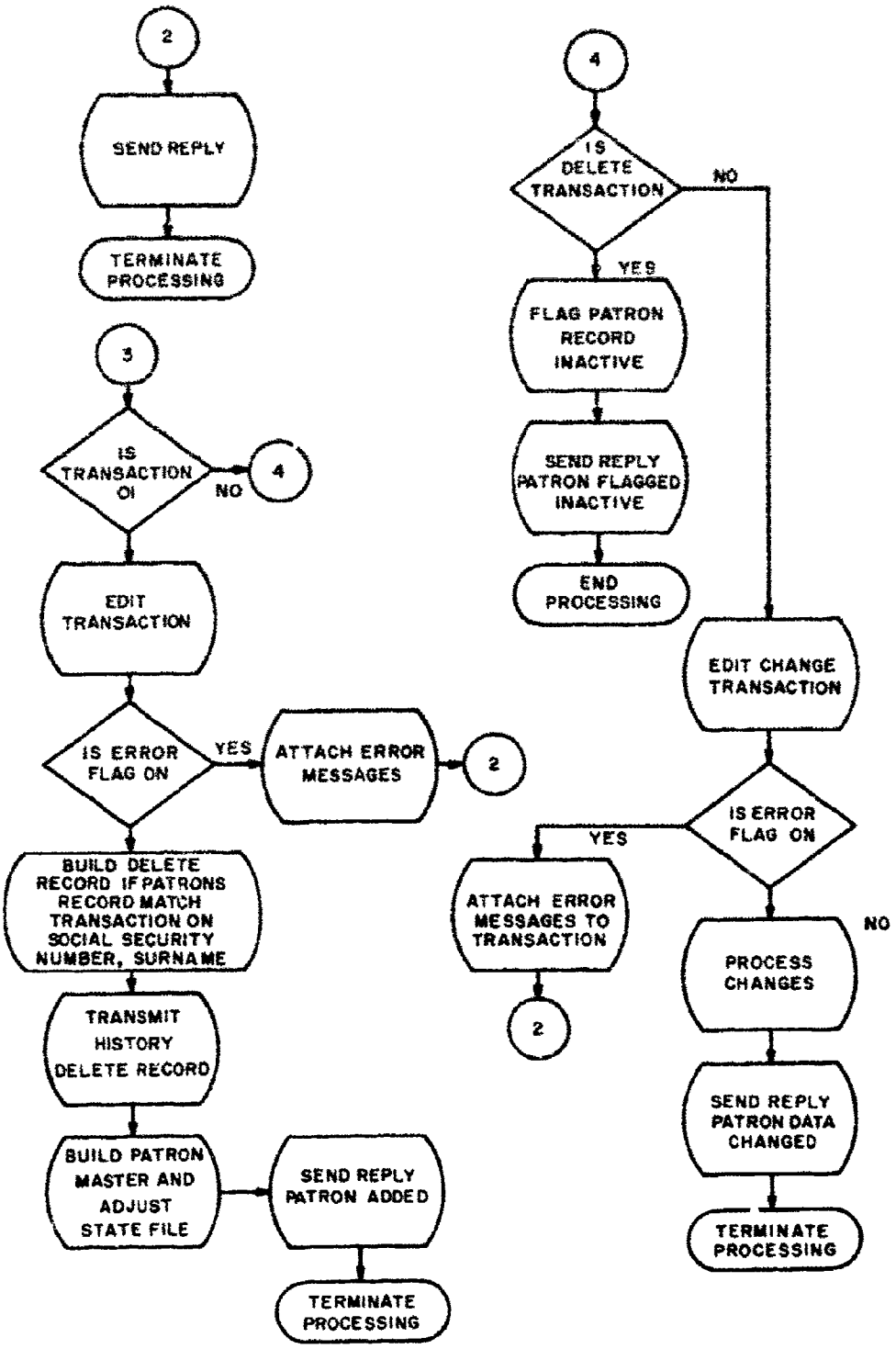

Figure 59. (Concluded)

PATRON RECORD DELETES ADDED ON 21 JAN 65 DELETED ON 27 SEPT 66

LINE a 410-48-2001 WILLIAMSONbbbbbbb JAMES B. bbbbbbbbbb III LTbCOL N S ol

LINE b AMSMI-RBbbbb RM1234BL1234 PHONE 876-6610 EXT 241

LINE c STREET CITY STATE ZIP

LINE d COMMENTS.

Figure 60. Purged Patron Record

001 TOTAL PATRONS	002 TOTAL ARMY PATRONS 5	003 TOTAL NASA PATRONS 5	004 TOTAL IN-HOUSE 5 CONTRACTORS	005 TOTAL OUT-HOUSE 5 CONTRACTORS	006 TOTAL MILITARY PATRONS 5	007 TOTAL OTHER PATRONS 5	008 ADDITIONS TO FILE PER MONTH	009 DELETIONS TO FILE PER MONTH

010 CHANGES PER MONTH	011 ACCESSIONS TO FILE PER MONTH	012 TOTAL PATRONS WITH MORE	013 BOOKS OVERDUE 1ST NOTICE	014 BOOKS OVERDUE 2ND NOTICE	015 BOOKS OVERDUE 3 RD NOTICE	016 TOTAL PATRONS CLEARED	017 TOTAL PATRONS TOP SECRET	018 TOTAL PATRONS SECRET	019 TOTAL PATRONS CONFIDEN-TIAL	

Figure 61. Patron Financial and Statistical Record

BOOKS MASTER FILE

B01 CALL NUMBER	B02 TITLE	B03 AUTHOR	B03 COPY NUMBER	B04 TIMES CIRCULATION
V(37)	V	V	(3)	(4)

B05 LOCATION (WHO)	B06 DATE	B07 STATUS AND TYPE	B08 PATRON RECALL SOCIAL SECURITY NUMBER	B09 DATE	END RECORD
(10)	(4)	(1)	(V)	(4)	

BOOK CIRCUL[illegible]ON CARD

ACTION CODE	LC CALL NUMBER AND AUTHOR AND TITLE. AN ASTERISK SEPARATES THE CALL NUMBER FROM THE AUTHOR TITLE.	SECURITY CLASSIFICATIO[illegible]	

Figure 62. Books Master File

CIRCULATE AN ITEM KEYBOARD INPUT AND CARD INPUT

TRANSACTION CODE 29 (2)	TYPE LOAN 1, 2, 8, 9 (1)	SOCIAL SECURITY NUMBER OR PATRON FULL NAME (SOCIAL SECURITY NUMBER 10) (NAME 14)	ACTION CODE (NOT USED)	CALL NUMBER AND AUTHOR AND TITLE ASTERISK SEPARATES CALL NO. FROM AUTHOR TITLE 2-50	SECURITY CLASSIFICATION 51 (1)	TYPE LOAN (NOT USED)	
ENTER THROUGH KEYBOARD			ENTER THROUGH CARD READER				

RETURN OF LOANED ITEM

TRANSACTION CODE 30 (2)	ACTION CODE (NOT USED) (1)	CALL NUMBER AND AUTHOR AND TITLE ASTERISK SEPARATES CALL NO. FROM AUTHOR AND TITLE 2-50	SECURITY CLASSIFICATION 51	TYPE LOAN 1, 8, 9 (IS USED) 52	BLANK 53-56	SOCIAL SECURITY NUMBER OF PATRON 57-65 (10)	PATRON LAST NAME 67-78 (12)	INITIALS 79-80 (2)
KEY	ENTER THROUGH CARD READER							

RECALL OF BOOK OR BOOKS

TRANSACTION CODE 31 (2)	CALL NUMBER INCLUDES ASTERISK SEE NOTES (MAXIMUM 37) V	PATRON SOCIAL SECURITY NUMBER (REQUESTING PATRON) (10)	
ENTER THROUGH KEYBOARD			

NOTE:
1. TO RECALL ALL BOOKS FOR REPROCESSING, LEAVE COPY NUMBER FIELD BLANK.
2. TO RECALL A SPECIFIC BOOK, INCLUDE FOR REPROCESSING COPY NUMBER IN CALL NUMBER FIELD
3. TO RECALL A BOOK FOR ANOTHER PATRON, INCLUDE COPY NUMBER IN CALL NUMBER FIELD AND SOCIAL SECURITY NUMBER OF PATRON REQUESTING BOOK. IF ALL COPIES ARE TO BE RECALLED, LEAVE COPY NUMBER BLANK.

Figure 63. Transaction Formats (Circulate an Item, Return of Loaned Item. Recall of Book)

RENEWAL OF BOOK LOAN

TRANSACTION CODE 32 (2)	TYPE OF LOAN	ACTION CODE (NOT USED) (1)	CALL NUMBER AND AUTHOR AND TITLE ASTERISK SEPARATES CALL NUMBER FROM AUTHOR AND TITLE (2-50)	SECURITY CLASSIFICATION (51)	TYPE LOAN (NOT USED) (1)	BLANK	SOCIAL SECURITY NUMBER OF PATRON (9)	PATRON LAST NAME	INITIALS (2)
KEYBOARD		CARD READER OR KEYBOARD							

FLAG AN ITEM AS LOST

TRANSACTION CODE 33 (2)	CALL NUMBER INCLUDE ASTERISK (MAXIMUM 36) V	
KEYBOARD		

FLAG AN ITEM AS FOUND

TRANSACTION CODE 34 (2)	CALL NUMBER INCLUDE ASTERISK (MAXIMUM 36)	
KEYBOARD		

Figure 64. Transaction Formats (Renewal of Book on Loan, Flag an Item as Lost, Flag an Item as Found)

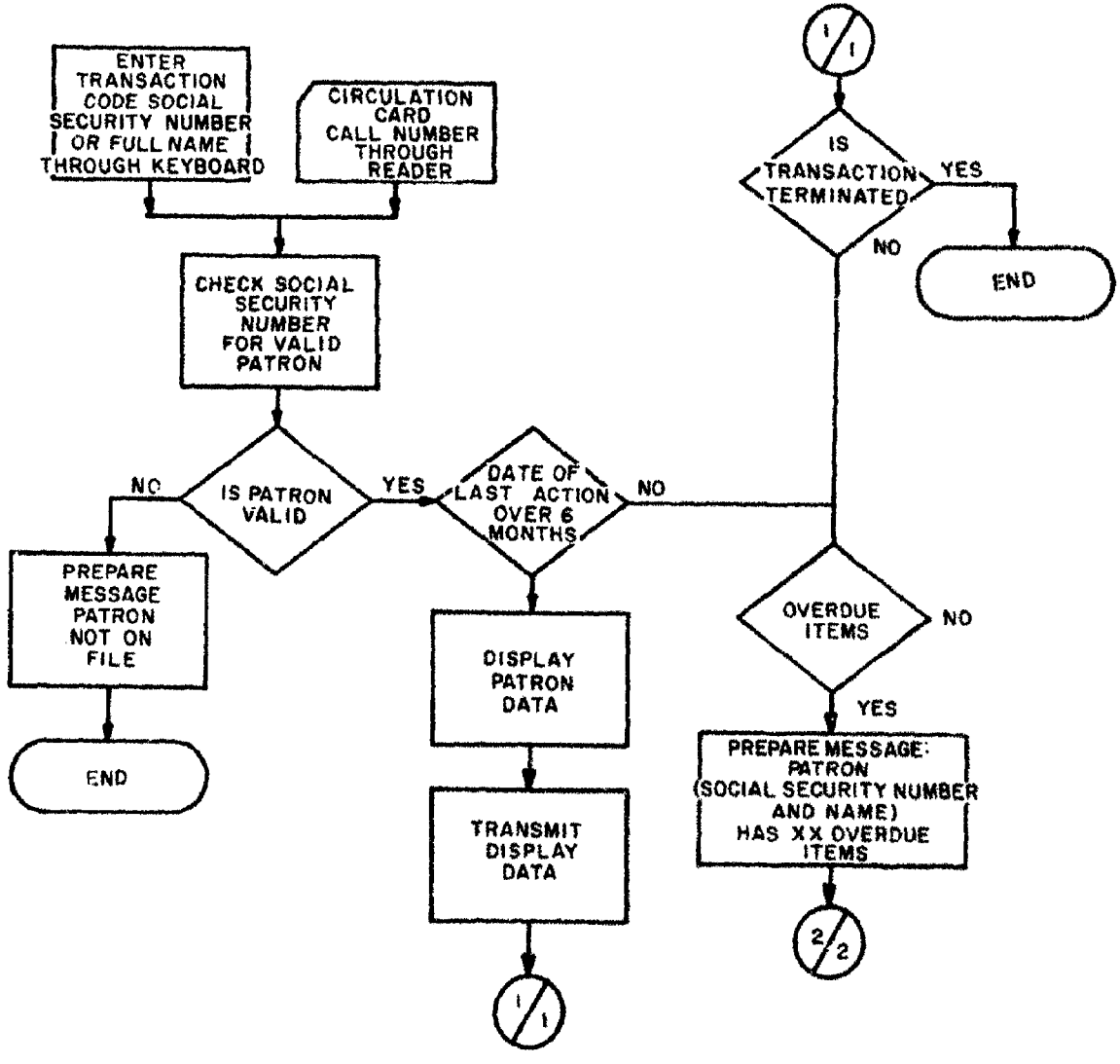

Figure 65. Book Circulation Control

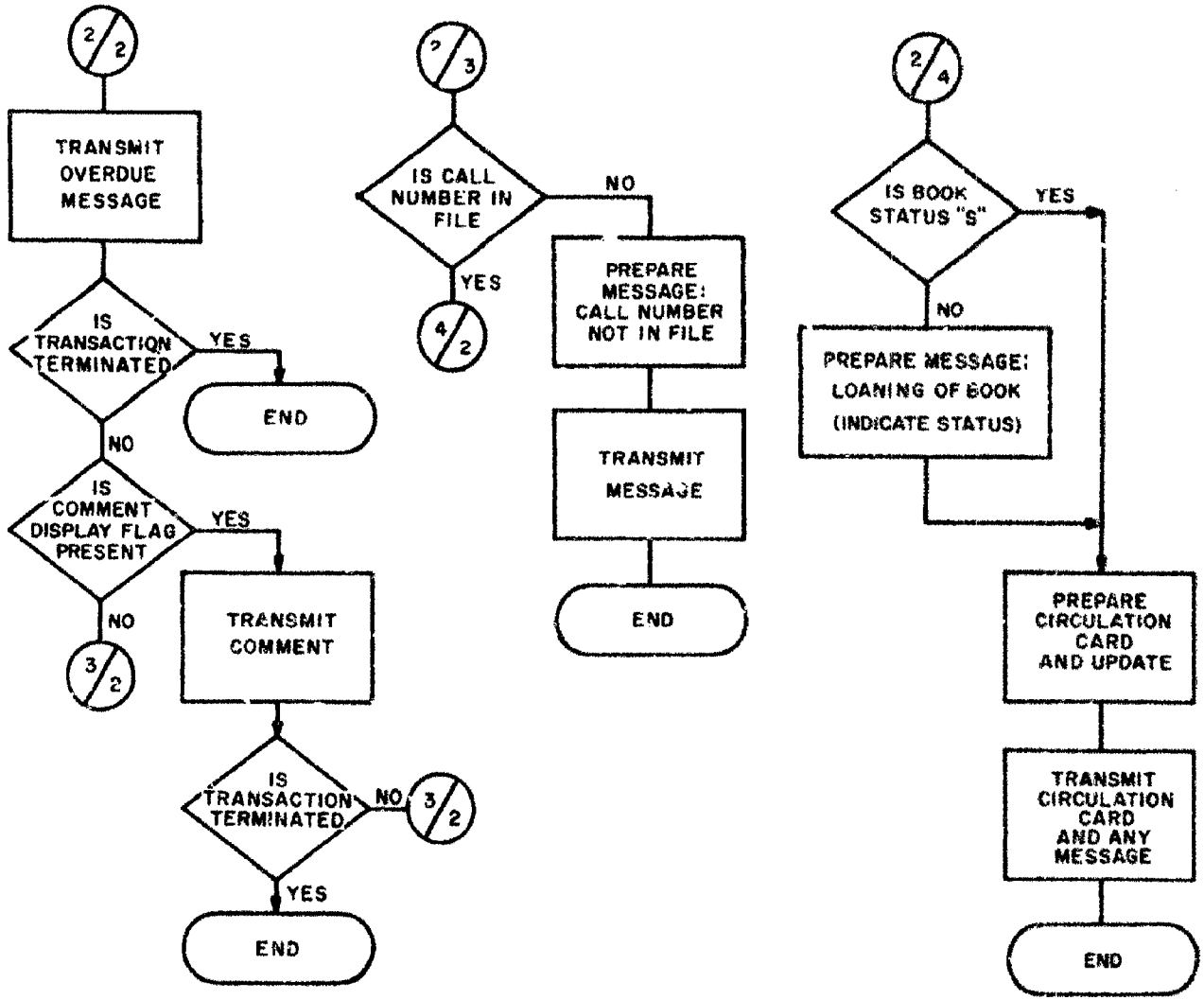

Figure 65. (Continued)

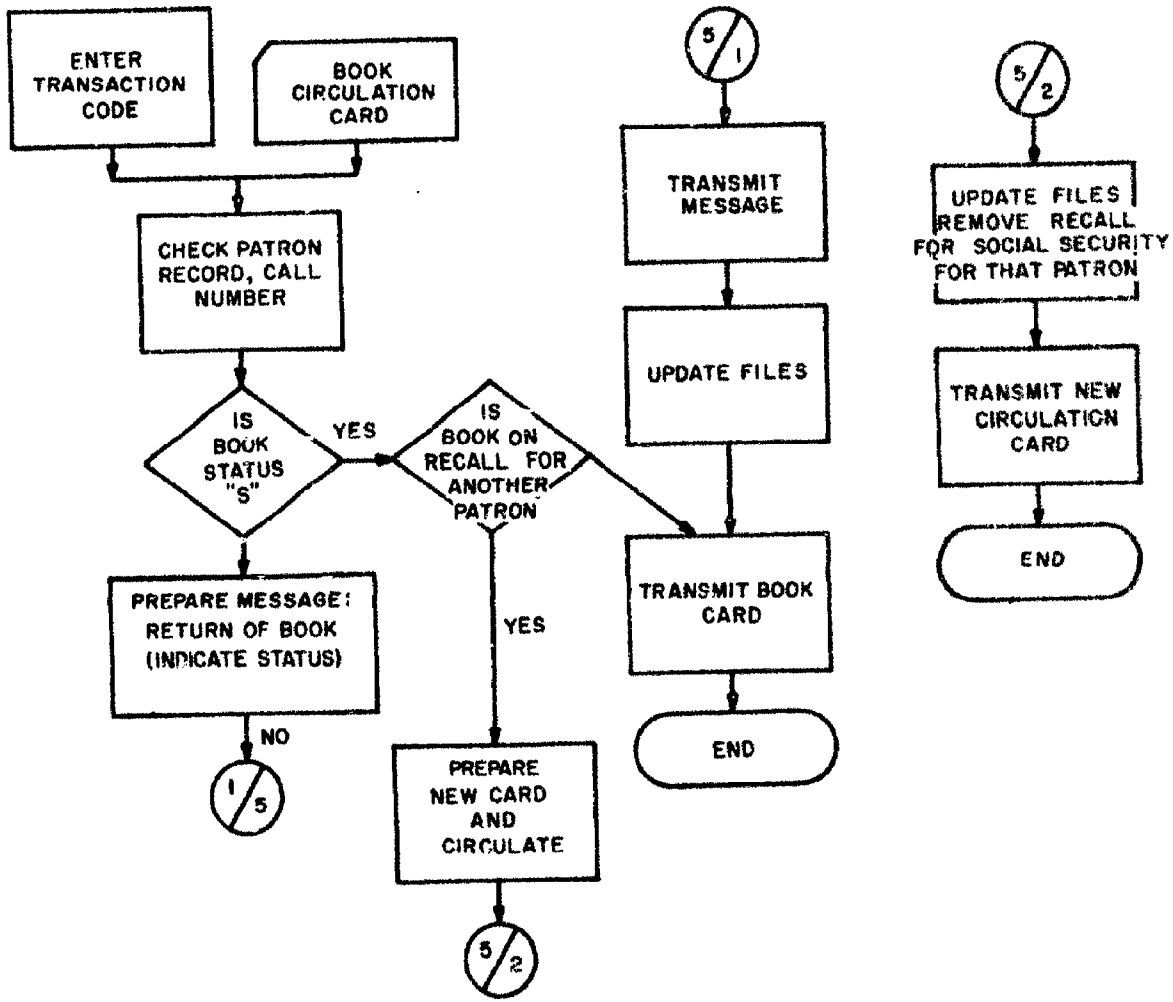

Figure 65. (Concluded)

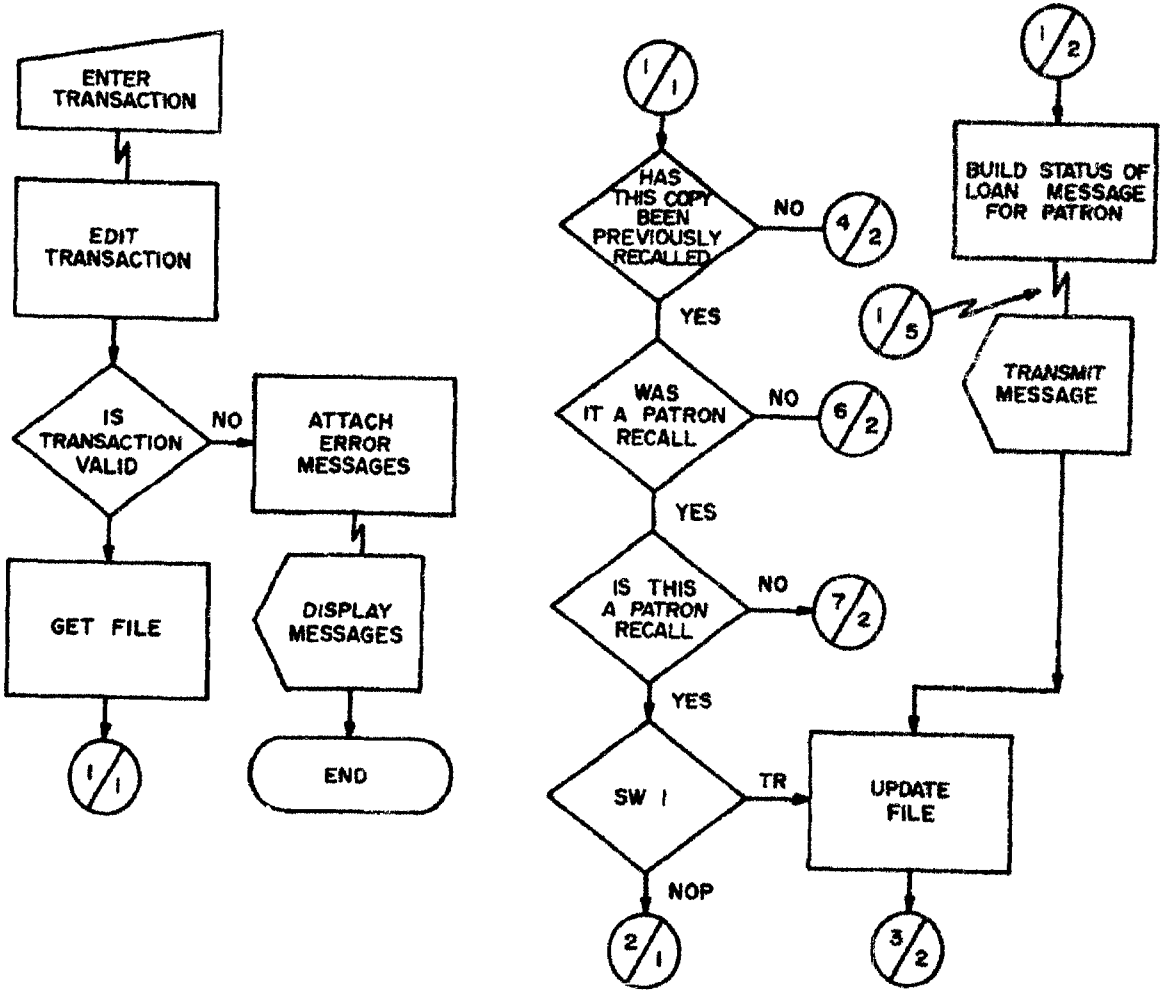

Figure 66. Recall of Books on Loan for Reprocessing or for Another Patron

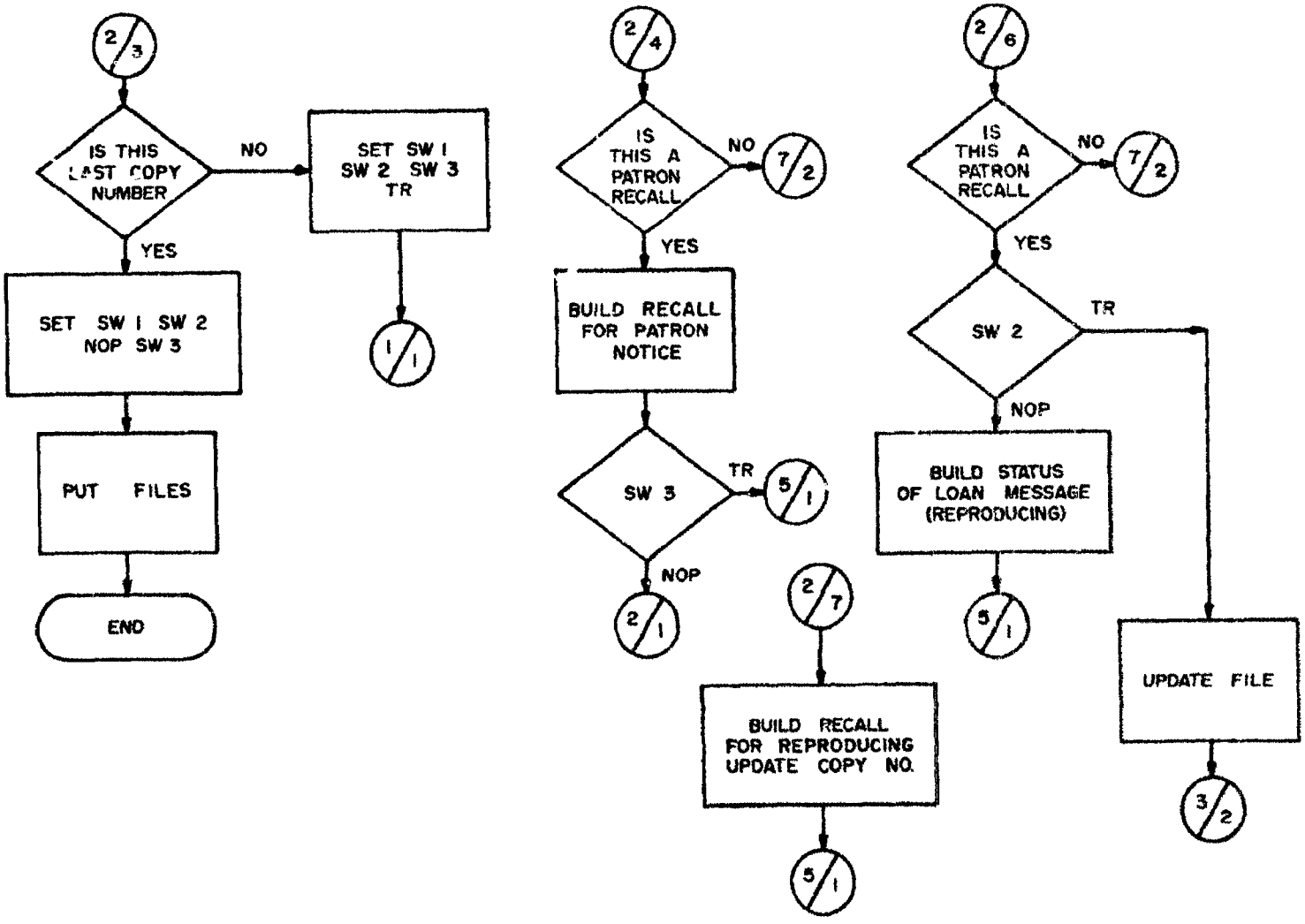

Figure 66. (Concluded)

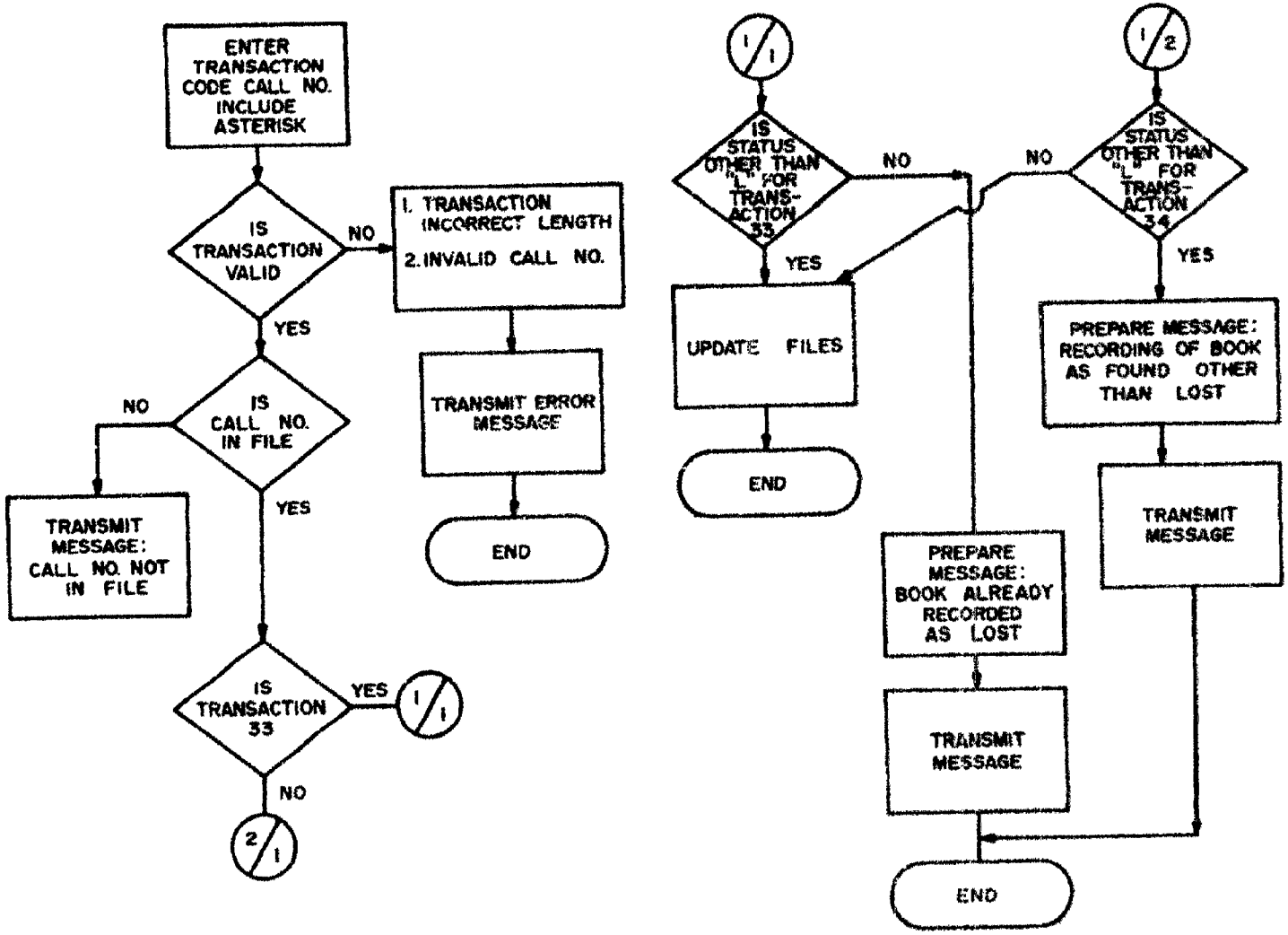

Figure 67. Flag a Book as Lost or Found

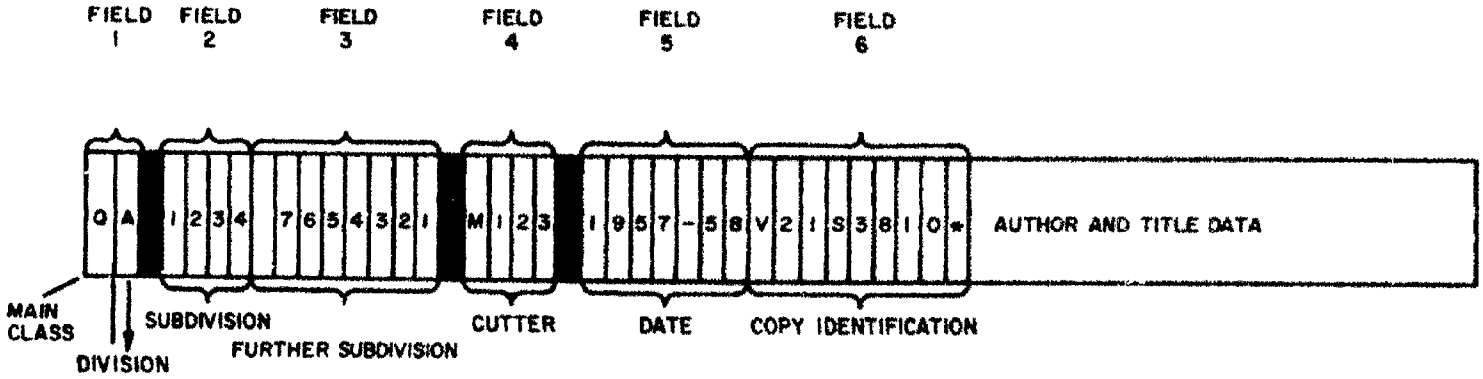

Figure 68. LC Call Number Format

Fold

TO PATRON NAME AND INITIALS
STREET/OFFICE SYMBOL
CITY/BUILDING

SOCIAL SECURITY NO. DA MON YR
PHONE xxx xxxx
DATE OF LOAN DA MON YR

RECALL FOR REPROCESSING xxx NOTICE

.. .. .. Fold

FROM SIGNATURE BLOCK

THE BOOK LISTED BELOW IS BEING RECALLED FOR REPROCESSING. PLEASE RETURN IT TO THE ABOVE ADDRESS WITH THIS NOTICE TO SPEED HANDLING IN THE LIBRARY. IF YOU WISH THE BOOK RETURNED TO YOU AFTER REPROCESSING, PLEASE CHECK HERE ..... .

CALL NUMBER....
AUTHOR/TITLE...

Figure 69. Recall for Reprocessing Notice

Fold

TO	PATRON NAME AND INITIALS	SOCIAL SECURITY NO.	DA MON YR
	STREET/OFFICE SYMBOL	PHONE	xxx xxxx
	CITY/BUILDING	DATE OF LOAN	DA MON YR

PATRON RECALL REQUEST

FROM SIGNATURE BLOCK

THE BOOK LISTED BELOW IS NEEDED FOR LOAN TO ANOTHER PATRON. IF NO LONGER REQUIRED, PLEASE RETURN IT TO THE ABOVE ADDRESS IN PERSON OR BY MAIL ALONG WITH THIS NOTICE.

CALL NUMBER....
AUTHOR/TITLE...

Fold

Figure 70. Patron Recall Request

TO	PATRON NAME INITIALS	SOCIAL SECURITY NO.	DA MON YR
	STREET/OFFICE SYMBOL	PHONE	XX XXXX
	CITY/BUILDING	DATE OF LOAN	DA MON YR

ACTION NOTIFICATION

Fold .. .. Fold

FROM SIGNATURE BLOCK

THE ITEM (CALL NO. AND TITLE) WHICH YOU REQUESTED IS NOT AVAILABLE FOR LOAN AT THIS TIME. ACTION IS BEING TAKEN TO OBTAIN A COPY, WHICH WILL BE MAILED TO YOU UPON RECEIPT.

Figure 71. Action Notification

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R&D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) Redstone Scientific Information Center Research and Development Directorate U.S. Army Missile Command Redstone Arsenal, Alabama 35809	2a. REPORT SECURITY CLASSIFICATION Unclassified 2b. GROUP N/A

3. REPORT TITLE

COMPATIBLE AUTOMATED LIBRARY CIRCULATION CONTROL SYSTEMS

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

None

5. AUTHOR(S) (Last name, first name, initial)

Umstead, Charles R. and Croxton, Fred E.

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
15 April 1967	172	0

8a. CONTRACT OR GRANT NO. N/A b. PROJECT NO. N/A c. d.	9a. ORIGINATOR'S REPORT NUMBER(S) RSIC-663 9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report) AD

10. AVAILABILITY/LIMITATION NOTICES

Distribution of this document is unlimited.

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
None	Same as No. 1

13. ABSTRACT

This report describes five more or less standard and highly compatible circulation systems which incorporate a common form of input and which require a minimum of conversion from traditional manual operations. These five systems are: (1) manual system, (2) punch card accounting machine circulation system, (3) small scale control system, (4) large scale control system, and (5) on-line control system.

DD FORM 1 JAN 64 1473

UNCLASSIFIED

Security Classification

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
ALPHA Library of Congress call number Patron request card Action code Patron file Circulation file						

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